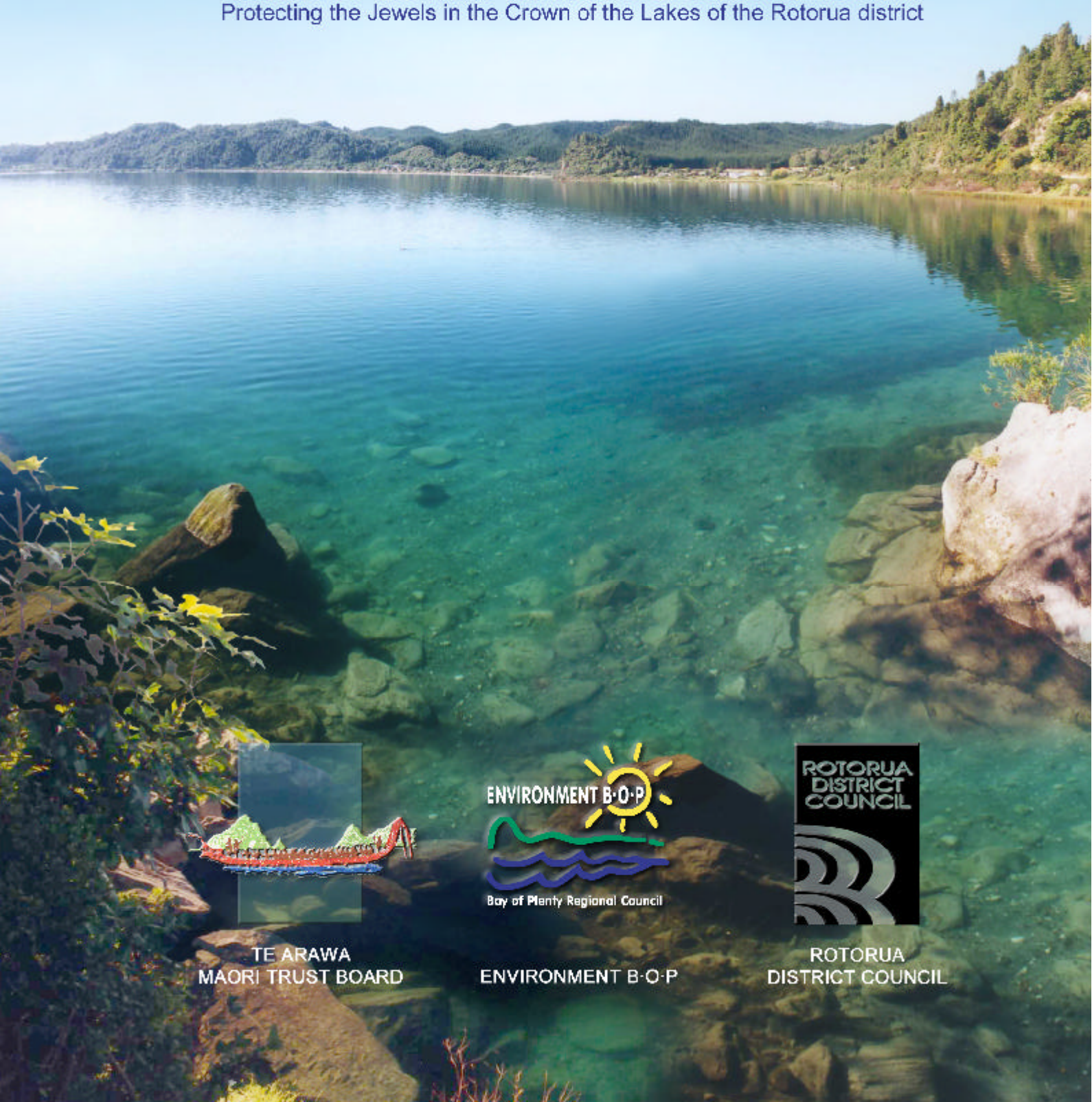
Strategy for the Lakes of the **Rotorua** district

'Te Kaupapa mo Nga Taonga o Rotorua'
Protecting the Jewels in the Crown of the Lakes of the Rotorua district



TE ARAWA
MAORI TRUST BOARD

ENVIRONMENT B·O·P
Bay of Plenty Regional Council

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ROTORUA DISTRICT COUNCIL

ROTORUA
DISTRICT COUNCIL

Foreword

For the past two years the Lakes Management Strategy Working Group has been preparing a Lakes Management Strategy. The initial public discussion document entitled *Towards a Te Arawa Lakes Strategy* identified a significant range of concerns and interests in the long-term welfare of the lakes.

We remain committed to these views:

- We need to co-ordinate our efforts towards a shining and enduring vision for the lakes of the Rotorua district.
- We need a commonly held vision for the lakes and their catchments that provides leadership and acknowledges protection, use, enjoyment, and the interests of Te Arawa in the lakes.
- The purpose of the vision is to focus community energy and resources into tasks that ensure that this vision is achieved.
- We must ensure that we identify and prioritise the issues properly, that we identify the total costs and benefits of actions, that we are committed to carrying out our tasks, that we review our actions regularly for effectiveness and accountability, and that we report publicly.

This strategy is not a statutory document under either the Resource Management Act or the Local Government Act or any other Act. Our aim is rather to identify and address the problems arising from a lack of co-ordination between many interests in management of the lakes and then to consider how the law and those concerned can work together to solve those problems as effectively and efficiently as possible. We see the Lakes Management Strategy as being an ongoing process with regular review and accountability for achieving key goals that will make a difference and protect the lakes.

We acknowledge that various authorities are carrying out a variety of ongoing activities aimed at protecting the lakes. However, we believe that there is a pressing need to unite efforts and resources to achieve sustainable lake and catchment management, so that this and future generations can continue to use and enjoy the lakes. For the most effective use of community resources, we believe that it is essential to establish and maintain an overview group with a mandate to ensure accountability and action. We seek not only to identify what needs to be done but also to identify the costs involved and that the greatest benefit can be achieved for each dollar spent in meeting these goals.

In preparing this strategy we invite those of you with an interest in the future of the lakes, their catchments and the district to identify which of the key goals you see as important and what contributions you can make towards protecting our lakes.

Arapeta Tahana	John Keaney	Grahame Hall
Chairman, Te Arawa	Chairman	Mayor
Maori Trust Board	Environment B·O·P	Rotorua District Council

Executive Summary

This document is a management strategy for the lakes of the Rotorua district. It is a strategy based on a vision for the future underlined by practical steps towards achieving that vision. The strategy builds on over 30 years of lake research, intensive public interest and the April 1998 publication entitled *Towards a Te Arawa Lakes Management Strategy*. From the submissions and public consultation we have developed this community vision:

The lakes of the Rotorua district and their catchments are preserved and protected for the use and enjoyment of present and future generations, while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes.

Three basic issues feature in the vision – protection, use and enjoyment, all in the light of Te Arawa's traditional relationship with their ancestral lakes. We must acknowledge each issue in order to determine the practical steps necessary to achieve the community vision. Our analysis reveals 14 key goals. These are outlined on page 19 of this document.

Protection Goals

No. 1: Address the causes of lake water pollution.
No. 2: Deal with pollution from septic tanks.
No. 3: Determine the extent of pollution from stormwater runoff.
No. 4: Define and refine lake water quality standards.
No. 5: Examine the status and future of the catchment bank protection scheme.
No. 6: Address plant and animal pest problems.
No. 7: Determine present and future reserve areas.

Use Goals

No. 8: Establish an urban development policy.
No. 9: Establish a rural development policy.

Enjoyment Goals

No. 10: Develop a recreation strategy.
No. 11: Monitor and report on recreation activities.
No. 12: Define esplanade reserve areas to ensure public access to each lake.

Management Goals

No. 13: Establish in partnership with Te Arawa a co-management framework that achieves the best integrated management.
No. 14: Establish meaningful and binding working relationships with the iwi/hapu and their ancestral lakes.

This document focuses on identifying problems, the options for resolving them, the costs and benefits involved, agreeing on the best solution, putting in place monitoring and reporting procedures for accountability and ensuring regular reviews of the effectiveness of each solution. It is therefore important that for each task we identify the costs involved in achieving a particular solution and the effectiveness of that solution in order that the community can ensure that it gets the best value for ratepayer funds committed to the Lakes.

We regard these actions as fundamental in ensuring that the tasks are both realistic and prioritised. We acknowledge that this management process will take time. It is, therefore, important that a time scale is established and that there is a process of monitoring of the effectiveness and performance of those mandated to work towards the fifteen goals.

We recommend that the Lakes Strategy Working Group, comprising the Chairman -Te Arawa Maori Trust Board, the Chairman - Environment B·O·P and Mayor - Rotorua District Council, continue to manage and report on the strategic process outlined in this strategy.

We invite individuals and organisations with skills, expertise and interest to identify and participate in those tasks to which they feel they can best contribute.

If the key goals are achieved, the community will be significantly closer to achieving its vision for the lakes of the Rotorua district.

Contents

Part I - Establishing a Community Vision

Introduction

In line with the traditional Maori holistic view of the lakes and their catchments, this document presents a management strategy for the lakes of the Rotorua district and their catchments. The aim is to combine the interests of the district into one community vision. To achieve this aim, we invite you, as members of the public, to share in the planning and implementation of the chosen strategies.

We acknowledge that:

- There are many mandates for looking after the lakes.
- There is a wide variety of interests and concerns for the future of the lakes.

This working draft contains a strategy for the lakes as a group and for each lake individually. It begins by establishing an overall vision for the lakes as a whole and a series of goals to be met on the way to achieving that vision. It examines urban development, rural development, recreation, water quality, water quantity, plant and animal pests, natural hazards and the traditional relationship of Te Arawa with the lakes. Some issues are common to all of the lakes, while others apply to only some of them.

Till now, a number of organisations, including Environment B·O·P, the Rotorua District Council and Te Arawa Maori Trust Board, have been working independently towards improving the management of the lakes of the Rotorua district. This strategy will co-ordinate the actions of these three organisations, together with those of other interested parties, such as the Department of Conservation, residents' and ratepayers' associations and individual hapu, to ensure that all the actions that promote sustainable management of the lakes are consistent and complementary and that the most important matters are addressed first.

A comparison of the vision with the current status of the lakes and their catchments reveals the policy gap and the issues to be addressed. We have identified options to address those issues, our preferred options and our recommended actions to implement those options.

To promote the sustainable management of a lake, it is necessary to promote the sustainable management of its catchment because the land activities in a lake catchment have an impact on the lake itself. For example, the land-based activities in a catchment affect the water quality and the landscape of that lake. In turn, the water quality and landscape affect people's ability to use and enjoy the lake.

Because pastoral and urban land uses have the greatest potential to harm water quality, they are the focus of much of the attention in this document. The information provided on lake catchments includes data on the percentage of each catchment that is urban and the percentage that is pastoral. The remainder of each catchment has either other exotic vegetation or indigenous vegetation, the latter being the natural land cover for the lake catchments before human intervention. Native bush

and exotic forests affect nutrients and bacteria in lake water quality less than pastoral or urban land uses. However, some shallow lakes containing geothermal inputs, for example Lake Rerewhakaaitu, would be unlikely to have very high water quality (low levels of nutrients) even if their entire catchments were covered in vegetation. This is because geothermal inputs contribute nutrients to a lake, and light penetration to the beds of shallow lakes is greater than light penetration to the beds of deep lakes.

The overall vision for the lakes and the individual visions for each lake create a continuum for lake management moving from a development focus at one end (the catchment of Lake Rotorua) to a protection focus at the other end (the catchment of Lake Okataina). Other lakes within the Rotorua district fall somewhere in between these two extremes, with Lake Rotoiti leaning more towards development and Lake Rotokakahi leaning more towards protection. The proposed management of the lakes reflects their particular individual characteristics. For example, Lake Tarawera is highly valued for its landscapes, Lake Rotoma is highly valued for its clear water, and Lake Tikitapu is highly valued for its recreational opportunities.

So far we have not quantified the costs and benefits associated with each of the recommended actions. Although it may be possible, from existing information, to quantify these costs, it is not possible to quantify the benefits of each option because so little non-market valuation information is available. To bridge this information gap, a valuation of the benefits of key options for improving the environmental management of the lakes could be commissioned. Meanwhile, we have assessed options by the extent to which they meet the overall vision and the visions for each lake.

Environment B·O·P, the Rotorua District Council and Te Arawa Trust Board invite comments on the actions recommended in this document. We have tried as far as possible to incorporate all the issues raised in submissions on the *Towards a Te Arawa Lakes Strategy* document.

Having discussed the contents of this strategy with interested groups and individuals, we will then establish teams to work on each of the key goals. These teams will consist of Environment B·O·P, Rotorua District Council, Te Arawa and interest group representatives, and will consider the funding and timing of the actions and tasks set out in the appendix at the end of this document. When necessary, these teams may also need to consider the likely costs and benefits of whatever tasks they propose to undertake.

The next step is to establish key goal teams and complete proposals for funding and timing of tasks. Both Environment B·O·P and the Rotorua District Council are programmed to review their strategic plans in 2000, and intend to include information on budgetary requirements for the Lakes Strategy in their planning documents.

A call for participation by interested groups and individuals appears on page 9.

For any further information about this strategy, please contact the chief executive officers of Environment B·O·P, the Rotorua District Council or Te Arawa Maori Trust Board.

The Scope of the Vision

For the Maori community in particular and the people of Rotorua in general there is a sense of pride, place, mana, status and culture involved in achieving excellence in managing the lakes. The Maori perspective, which takes a holistic view of the issues, has significant benefits. Conversely, an approach that compartmentalises jurisdictions can fail to address broad management problems in a co-ordinated and cohesive manner.

The management of a lake includes issues relating to the catchment of that lake. The catchment area includes the rivers, streams, tributaries and land area that feed water into a lake.

The interrelationships between land and water are important and must be acknowledged at all times. Equally, the quality of the water within any lake catchment is the litmus test of good or bad management of that lake (water being seen as the single unifying element throughout the catchments).

The Lakes Management Strategy is a unique opportunity to strategically manage the lake environment to achieve a balance between lake protection, use and enjoyment.

Key Community Values

Discussions and consultations revealed five key community values:

- The right of public access, use and enjoyment of the lakes.
- The principle of guardianship (described as kaitiaki when exercised by the tangata whenua) and the protection of the mauri of the environment (indicating that the environment has a life force of its own and is not an inert, lifeless object).
- The principle of sustainable resource management (ensuring each generation can continue to use and enjoy the resources of the Rotorua district).
- The significance of community pride in the lakes reflected in the notion of “te mana o Te Arawa”.
- The requirement to take into account the principles of the treaty and to provide for the relationship of tangata whenua with their ancestral resources.

This management strategy for the lakes of the Rotorua district takes into account all the above values.

The Vision

Following consultation with the community, we propose the following community vision for the lakes:

The lakes of the Rotorua district and their catchments are preserved and protected for the use and enjoyment of present and future generations, while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes.

Part II - The Elements of the Vision

Identifying the Challenges

There are four key elements within the community vision for the lakes of the Rotorua district. Each element is important and interrelated with the others. They are:

- Protection
- Use
- Enjoyment
- Management.

From community consultation, submissions and discussions, we have identified these challenges:

- A need to establish or maintain high quality lake, river and stream water.
- A need to agree on the impacts of lake water pollution, including the effects of on-site effluent treatment, wildlife, stormwater run-off and pastoral land uses.
- A need to maintain the quality of the land, including reserved areas and landscapes.
- A need to acknowledge the effects of urban and rural development on lake water quality and to plan future urban and rural development in accordance with the community vision and the principles of sustainable management.
- A need to manage recreational uses of the lakes and waterways, and to maintain access to them.
- A need to recognise and provide for the traditional relationships of Te Arawa as tangata whenua with the lakes, as set out in the Resource Management Act and taking account of the principles of the Treaty of Waitangi.
- A need to identify the costs and benefits of meeting the community vision and to decide on timing, priorities and sources of funding.

This document analyses these challenges in terms of protection, use, enjoyment and management.

Protection

Protection involves identifying what should be protected and why, and addressing the methods and their benefits and costs. This document addresses protection under the following headings:

- Water quality – standards, point and diffuse discharges.
- Land environment – reserves, landscapes, pests.

Use

- Urban development – residential, commercial and industrial uses.
- Rural development – farming and forestry uses.
- Natural hazards – earthquakes, eruptions, floods.

Enjoyment

- Recreation – swimming, boating and walking.
- Mana – the pleasure of belonging.

Management

Management of the environment requires a holistic and integrated approach. This necessitates integration at the ecological, institutional and cultural levels.

At the cultural level, Te Arawa people have a traditional relationship with the lakes, rivers, stream and environs which requires an understanding of the distinctive Maori world view of resource management. This includes the need to protect the mauri of the lakes (indicating that the lakes have a life force of their own and are not inert, lifeless objects but are persons in their own right and therefore should be protected as such). The Maori dimension needs to be provided for by incorporating into resource management decision making and practice the following relationships:

- the spiritual relationship;
- the relationship of dependency, cultural survival and identity;
- the Rangatira relationship;
- the Kaitiaki relationship;
- the mana relationship;
- the customary ownership relationship.

Part III - Key Goals to Achieve the Vision

This part of the report sets out the broad issues that arise when the current state of the lakes and their catchments is compared with the vision for the lakes and their catchments.

From the public submissions on *Towards a Te Arawa Lakes Strategy*, consultation, discussion, a review of the issues, consideration of the key community values and reflection upon the community vision, we have identified key goals under each of the core element headings. If each of the goals is met, then the community vision for the lakes will also be met.

Protection

Key Goals

- Address the causes of water pollution.
- Deal with pollution from septic tanks.
- Determine the extent of pollution from storm water.
- Define and refine water quality standards.
- Examine the status and future of the catchment scheme for establishing stock-fenced, vegetated buffers along the banks of lakes and rivers.
- Address plant and animal pest problems.
- Identify present and future reserve areas.

Use

Key Goals

- Establish an urban development policy.
- Establish a rural development policy.

Enjoyment

Key Goals

- Develop a recreation strategy.
- Monitor and report on recreational activities.
- Define required esplanade areas for lake access.

Management

Key Goals

- Establish in partnership with Te Arawa a co-management framework that achieves the best integrated management.

- Establish meaningful and binding working relationships with the iwi/hapu and their ancestral lakes.

Strategic Analysis

Addressing each key goal strategically creates an opportunity to resolve the problem that underlies the issue. The approach is systematic and involves the following processes:

- Identifying the problem

- Defining alternative solutions to the problem

- Identifying the benefits and costs involved

- Selecting the best solution

- Establishing who is to be responsible for achieving the solution

- Determining when the solution should be completed by

- Monitoring and reporting performance

- Evaluating the effectiveness of the solution.

Call for Action

For each goal we have prepared a proposed schedule of tasks, and invite interested parties to identify where they could contribute, either by managing a task or by participating in a team working towards resolving a particular problem. The challenge is to work systematically towards resolution of the issues identified in the key goals. Participation is in part ownership of a problem and in part ownership of a solution that will significantly contribute towards achieving the community vision for the lakes.

We particularly draw to your attention the need to establish two working parties representative of all interested groups: one to plan the desired reserve areas, and another to develop a recreation strategy, for the Rotorua district. For more detailed information on these and other tasks, please see the Schedule of Tasks in Appendix A of this document.

This is an important invitation to participate in a scheme of strategic management for the lakes of the Rotorua district. We will be establishing teams to advance each of the key goals. These teams will consist of Council, Te Arawa and interest group representatives, and will consider the funding and timing of the actions and tasks set out in Appendix A of this document. These teams may also need to consider the likely costs and benefits of their proposed actions.

An Invitation to You

Environment B·O·P, the Rotorua District Council and Te Arawa Maori Trust Board are all excited by the vision set before you. We look forward to your participation in the project. Once the key goal teams are established, Environment B·O·P, the Rotorua District Council and Te Arawa Maori Trust Board will be calling for participation from interested community groups and individuals to implement the strategy. If you would like to be involved, please write to us now and let us know of your interest. Please include an outline of each of the following:

1 The particular **opportunity** within the vision that interests you.

2 Your **objectives** for making that opportunity become a reality.

3 Your proposed **methods** for achieving your objectives.

4 The **qualifications** (both academic and practical) members of your group have to enable you to achieve your objectives. Evidence of previous work may be appropriate also, either here or as an attachment.

5 Your estimate of the **costs** involved. Please break this down into its components. Please also let us know if you represent an organisation that is in a position to contribute some or all of your costs.

6 Your estimate of the **time** involved. Again, please break this down, indicating when you hope to complete each stage of the project. Include possible start and finish dates.

7 The benefits that will accrue from your involvement.

Part IV - Targeting Lake Priorities

This section of the analysis outlines significant actions and priorities, lake by lake, so allowing an overall strategy for priorities and funding to be developed. It is based on the information about the lakes given in Appendix B, page 33. The factors listed below have been used to prioritise the actions needed to address environmental problems for the lakes.

- Population: The greater the population, the greater the requirement for action.
- Risk of existing environmental degradation continuing or new environmental degradation occurring if no action is taken: The greater the risk, the greater the requirement for action.
- Natural state: The closer the lake and its catchment are to their natural state, the greater the need for protective action.
- Natural character: The closer the lake and its catchment are to their natural character, the greater the requirement for preservation of that character.

Based on these four criteria, the following ranking of the lakes is suggested:

1 Rotorua
2 Rotoiti
3 Okataina
4 Okareka
5 Tarawera
6 Rotoma
7 Rotoehu
8 Rotokakahi
9 Okaro
10 Rerewhakaaitu
11 Rotomahana
12 Tikitapu

Part V - Meeting the Costs

Meeting the Costs

For each goal, a strategy has been identified to meet set objectives. An important part of that strategy is identifying the costs involved.

Identifying the Benefits

Emphasis is also placed on establishing the benefits that will accrue from taking any particular action.

Value for Money

The cost-benefit process applied in this strategy ensures that priorities can be determined by requiring that the greatest benefits be obtained for each dollar spent on the Lakes. That is, in working towards a Vision for the Lakes, there is value for money spent.

Priorities

Total costs for achieving the Lakes Strategy have been identified as a key priority to provide a measure of the significance of the issues involved and to initiate the process of defining who meets what costs. Information on funding requirements is needed for the current reviews of local authority long term funding plans and the establishment of priorities for the spending of public funds.

Part VI - Ensuring Accountability

Management

Having identified the key goals that if achieved, in the order of priority given, would make the community vision for the lakes a reality, we must now ensure that people and organisations are accountable for work they do towards the vision.

We acknowledge that for the lakes of the Rotorua district there is no single body accountable for all matters identified in the key goals. Indeed accountability ultimately lies with the community to work towards its vision. However, for this project, accountability needs to remain with the leaders from Te Arawa Maori Trust Board, Environment B·O·P and Rotorua District Council until the work is completed.

Most of the issues identified in this Lakes Strategy are well known. The problem has been to address these issues in a co-ordinated plan. The role of the key goal teams discussed in the introduction to this strategy will be to complete their section of the following matrix to enable progress towards the overall vision.

Strategic Management Performance Matrix

Key Goal	Responsible Agency	Cost	Completed	Monitoring
Protection				
Water Quality				
Pollution Causes				
Septic Tanks				
Stormwater				
Catchment Scheme				
Pest Control				
Reserves				

Key Goal	Responsible	Agency	Cost	Completed
Use				
Urban Growth Policy				
Rural Growth Policy				
Enjoyment				
Recreation Activities				
Recreation Plan				
Esplanade Access Review				
Management				
Establish co-management framework				
Establish relationships with iwi/hapu				

Part VII - Putting It All Together

Lakes Management Strategic Model

Protection and preservation of the lakes of the Rotorua district for the use and enjoyment of the community while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes. The vision, goals and tasks for the strategy are set out in chart form on page 19.

Protection

Key Goals:

Address the causes of water pollution

Deal with pollution from septic tanks

Define extent of pollution from stormwater

Define water quality standards

Examine the status and future of the catchment bank protection scheme

Adopt pest control programmes

Identify present and future reserve areas

Use

Key Goals:

Establish urban development policy

Establish rural development policy

Enjoyment

Key Goals:

Development of a recreation strategy

Monitor and report on recreation activities

Define access around margins of lakes

Management

Key Goals:

Establish in partnership with Te Arawa a co-management framework that achieves the best integrated management.

Establish meaningful and binding working relationships with the iwi/hapu and their ancestral lakes.

Strategic Management Key Tasks

- Maintain a continuing overview
- Consult
- Identify problems
- Prioritise problem resolution
- Identify total costs
- Identify responsibilities
- Ensure accountability
- Ensure agreed timetables met
- Report to the public
- Advocate

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Appendix A - Schedule of Tasks

We have used a simple template covering the process of strategic analysis, the information known to date and the information as yet unidentified for each of the 14 key goals under the headings **Protection, Use, Enjoyment** and **Management Goals.** Each time we outline the causes of the problem, suggest options for solving it, and give our preferred option before listing the tasks. The goals and tasks are outlined in chart form on page 19.

Protection Goals

Objective 1

The establishment and maintenance of high quality water in lake, rivers and streams.

Problems

Lake, stream and river water degradation can be caused by:

- Natural processes
- Clearing of vegetation
- Pastoral land uses
- Fertilisation practices and fertiliser run-off
- Discharges from urban settlements, septic tanks, stormwater systems and runoff

Situation Statement

- We consider defining and refining water quality standards critical to assess future discharges and to determine performance criteria, benefits and costs for upgrading current activities.
- In the absence of agreement between Rotorua District Council and Environment B·O·P, Environment B·O·P has continued to undertake actions it considers will improve water quality. These include implementing the *Operative On-Site Effluent Treatment Regional Plan* and continuing managing the lake and river margins. It has responsibility to do so under the Soil Conservation and Rivers Control Act and the Resource Management Act. An agreement between the two councils would allow joint priorities to be established, and make it easier to plan further measures to improve water quality.
- An estimate of total benefits and costs for maintaining or improving our water quality is needed.

Options for Action

Option (a): Continue the current practice of responding to water quality issues as they arise, with responsibility remaining with Environment B·O·P.

Option (b): Ignore pollution issues until they become serious problems, and the Rotorua community can fund large scale and extreme remedies.

Option (c): Accept that creating and maintaining high quality water is a community issue, and that Environment B·O·P and Rotorua District Council need to agree on an approach to water quality management while problems are still manageable and can be remedied at reasonable cost.

Selected option – (c).

Monitoring Performance

Annual publication of water quality, lake by lake, measuring control sites and public beach areas for bathing, clarity and chemistry – Environment B·O·P.

Reporting on outcomes of Tasks No.1–3: Management team.

Tasks

Task No. 1:	Environment B·O·P and Rotorua District Council to reach agreement on the relative sources of water quality degradation for each lake.
Objective:	To prioritise the causes of water quality degradation.
Responsibility:	Environment B·O·P and Rotorua District Council.
Public review agency:	Management team.

Task No. 2:	Refine the water quality standards applying to each lake.
Objective:	To encapsulate the existing natural state classifications for each lake within a scientific index that enables more accurate assessment of changes in factors affecting water quality.
Responsibility:	Environment B·O·P and Rotorua District Council.
Public review agency:	Management team.

Task No. 3:	To identify all river and lake margins where grazing is no longer allowed and all areas that are yet to be declared unavailable for grazing.
Objective:	To report on lake, stream and river buffer areas currently withdrawn and yet to be withdrawn from grazing and to determine the scale of the work, and the benefits and costs of present and future work, including maintenance.
Responsibility:	Environment B·O·P and Rotorua District Council.
Public review agency:	Management team.

Use Goals

Objective 2

The maintenance and enhancement of undeveloped natural areas and covenanted or reserved areas.

Problems

Attention needs to be paid to:

- Achieving a balance between use and protection.
- Identifying common goals and priorities for protection.
- Funding maintenance, enhancement and extensions of reserve lands.

Situation Statement

- We need to determine what land is either reserved or should be reserved.
- We need to identify why and how land should be reserved, depending on costs and benefits.
- Plant and animal pests cause problems within reserved areas.
- There is an ad hoc approach to reserve management due to the variety of reserve managers, including Crown (Department of Conservation), Rotorua District Council, Maori Scenic Reserves, and managers of private reserves, including covenanted areas.

Options for Action

Option (a): Continue the current practices of independent operation of reserve activities and occasional *ad hoc* decision making based on need.

Option (b): Establish a single reserve lands authority combining all reserved land interests to:

- Ensure an overview of all reserves activities and operations

- Define future reserve requirements
- Make effective use of resources allocated to reserved areas
- Ensure a holistic approach to advocacy for protected areas.

Option (c): Define the reserve database for the district. From monitoring use and community requirements, develop a long-term programme incorporating benefits and costs for management and development of reserved areas.

Selected option – (c).

Tasks

Task No.4:	Establish a working party representative of all reserved land interests for the purposes of creating an overview data base of reserved areas, advocacy, planning, policy, and costs and benefits of efficient and effective management of existing and future reserved areas.
Objective:	To acknowledge the importance of reserved areas in the Rotorua district.
Responsibility:	Rotorua District Council, Department of Conservation.
Public review agency:	Management team.

Task No. 5:	Identify the need for and importance of reserved areas.
Objective:	To establish the need for reserved areas and their role in economic and social development.
Responsibility:	Rotorua District Council.
Public review agency:	Management team.

Task No. 6:	Identify the threats to the maintenance of reserve areas.
Objective:	To establish the key requirements for maintaining the quality of the existing reserve areas, including dealing with threats from plant and animal pests.
Responsibility:	Environment B·O·P.
Public review agency:	Management team.

Objective 3

Controlling urban development and its effects on the lakes.

Problem: Effects of Uncontrolled Urban Development

- Loss of the existing environment - landscape values and natural character.
- Pollution from runoff and effluent discharge.
- Significant cost of community services - water reticulation, roading, sewage treatment.
- Potentially increased risks from natural hazards – geothermal, volcanic, flooding.

Situation Statement

Rotorua district has, through the district plan, an urban growth policy that seeks to:

- Support growth within the Rotorua urban area.
- Place some limitations upon lakeshore settlement development.

The Rotorua urban area model is being improved in terms of:

- Determining urban area development capacity, i.e. availability of land and services.
- Targeting urban environmental quality in terms of design, i.e. planning such matters as the central business district and residential density, and dealing with hazardous areas.

There is no clear model available for controlling the lakeshore settlements given:

- Concerns relating to clearing and infill development.
- A failure to address the cumulative effects of additional settlement.

The public does not yet realise that controlled development within the Rotorua urban area is an appropriate method of strategic management for protecting the lakes by limiting further development and extensions to the lakeshore settlements.

Options for Action

Option (a): Do nothing, and accept that ultimately there will be continuous lakeshore settlement around the shores of each of the Rotorua lakes.

Option (b): Retain the existing controls on lakeshore settlement development and await definitive answers from current and future research.

Option (c): Accept that sustainable management of the lakes in the Rotorua district requires a resource management policy that combines:

- A vision for each lake
- Current knowledge of effects of lakeshore settlement.

Selected option – (c).

Tasks

Task No. 7:	Create a sustainable urban growth model for the Rotorua district.
Objective:	Limit urban settlement on some lakes as a necessary requirement to protect the natural qualities of the lakes and lake waters and to minimise the potential impact of natural hazards.
Responsibility:	Environment B·O·P and Rotorua District Council.
Public review agency:	Management team.

Task No. 8:	Review of the Rotorua urban area to determine its capacity to sustain urban settlement and maintain a quality urban environment.
Objective:	To ensure that Rotorua urban area is an attractive and sustainable alternative to lakeshore urban development to assist protection of the lakes and lakes environment.
Responsibility:	Rotorua District Council.
Public review agency:	Management team.

Objective 4

Controlling rural development and its effects on lakes.

Problem: Effects of Uncontrolled Rural Development:

- Loss of the existing vegetated environment - landscape values and natural character.
- Pollution from land clearance, nutrient run-off, nutrient soakage and effluent discharge.
- Demand for extension of urban services such as roading, refuse collection, power and water.

Situation Statement

- Rotorua district has in its district plan a limited rural development policy with controls only on land subdivision, minor clearing and earth works.
- Other controls on rural development – land clearing, runoff control, earthworks – are through rules in the *Proposed Bay of Plenty Regional Land Management Plan.*

- There are significant urban area demands for high quality rural landscapes and preservation of natural values and protection of significant landscapes, without acknowledgement of the costs to rural landowners and compensation for limiting land use rights.

- There is a need for leadership and vision in which urban and rural areas complement each other, with a mutually dependent relationship.

Options for Action

Option (a): Do nothing and accept that ultimately rural areas are simply a transitional land use between undeveloped natural landscape and urban settlement.

Option (b): Retain existing rural policies and await the results of further scientific research into the effects of rural development.

Option (c): Allow rural and urban areas to develop a model for future development with both effects-based management and urban benefits and costs being control criteria.

Selected option – (c).

Tasks

Task No. 9:	Create a sustainable rural development model for the Rotorua district.
Objective:	To provide guidelines for rural development based on marginal costing for determining contributions to costs incurred.
Responsibility:	Rotorua District Council and Environment B·O·P.
Public review agency:	Management team.

Enjoyment Goals

Objective 5

The public can obtain the greatest possible pleasure from the lakes in the Rotorua district.

Problems

The following matters can interfere with the enjoyment the lakes can give the public:

- Too many people using popular areas and competition for space and outdoor experience.
- Lack of service facilities to support recreation activities.
- Recreation activities that are unsafe together, e.g. using powerboats and swimming.
- Failure to acknowledge importance of the total lake and river environment.
- Lack of a formula to levy payments for recreation support and services.
- Continuing concern for the right of access to the lakes and rivers.

Situation Statement

- Conflicts have arisen from various recreation activities on and close to the lakes and rivers.
- The importance of recreation and other leisure activities on lakes and waterways has not been acknowledged.
- Lake and waterway activities have not been co-ordinated and guided publicly.
- Recreation and leisure activities on the lakes have not been monitored to assist development of policy and public guidelines for the use of lakes and waterways.
- Agencies with an interest in the lakes and waterways have not worked together towards a common vision for the future of the lakes and their catchments.
- Benefits and costs of supporting recreation activities on the lakes have not been assessed.

Options for Action

Option (a): Ignore the lake recreation issues and let the users exercise their own individual preferences, including accessing of alternative areas both within the district and elsewhere.

Option (b): Combine recreation interests under a working group to produce a preliminary report, and then initiate elementary monitoring and a long term strategy for recreation activities in and on the lakes and their catchments.

Option (c): Under the supervision of a recreation interests working group, prepare a brief for the commissioning of a long term recreation strategy for the use of the lakes of the Rotorua district to be undertaken by an external agency contractor with appropriate skills.

Selected option – (c).

Tasks

Task No. 10:	Establish a single working group on recreational use of the lake, representing statutory and other interests including Eastern Fish and Game Council, Anglers' Association, Te Arawa Maori Trust Board, sporting and recreation groups, canoe, walking groups and any other interested parties. The working groups' brief to include monitoring and reporting on the use of the Lakes.
Objective:	The creation of a body of interests with a brief to: • Monitor and publicly report on recreation activities. • Prepare and recommend recreation guidelines to assist planning for statutory and other agencies protecting the lake water and catchment environments.
Responsibility:	Rotorua District Council and Department of Conservation.
Public review agency:	Management team.

Task No. 11:	Preparation and presentation of an annual report on the harbourmaster's activities, including operations, effectiveness of bylaws, safety, public relations, regulatory matters and costs.
Objective:	To ensure public accountability of harbourmaster activities.
Responsibility:	Rotorua District Council and Environment B·O·P.
Public review agency:	Management team.

Task No. 12:	Prepare a schedule identifying all areas required for the protection of public access to the margins of all streams, rivers and lakes in the district, including a report on the methods and costs of protection.
Objective:	To ensure the principle of public access to and around the margins of all rivers, streams and lakes in the district.
Responsibility:	Rotorua District Council and Environment B·O·P.
Public review agency:	Management team.

Management Goals

Objective 6

Achieving holistic management of the lakes and their catchments while recognising, understanding and providing for the traditional relationship of Te Arawa with their ancestral lakes.

Problems

Lack of integrated management, ecological and institutional, of the lakes and their catchments.

Misunderstanding of Te Arawa's traditional relationship with the lakes occurs through:

- Lack of knowledge of the importance of traditional relationships to Maori.
- Lack of opportunity to acknowledge and understand those things of importance to Maori.
- Difficulty of combining physical sciences (quantitative) with metaphysical knowledge (qualitative and spiritual).
- Poor application of the principles of the Treaty of Waitangi and the provisions in legislation, including the Resource Management Act 1991, that require consideration of traditional relationships.

Situation Statement

- Conflicts of understanding exist among the agencies administering the lakes.
- Conflicts exist between Maori and European notions of "ownership" and the different understandings are not accommodated in the existing management approaches.
- Of the land in the Waiariki Maori Land Court district, 28% is in Maori land title and 35% of the population of the Rotorua district are Maori, with that population seeking to manage their resources effectively and efficiently.
- The Resource Management Act 1991 has specific provisions that outline how councils must promote sustainable management, including:
  - ? Taking into account the principles of the Treaty of Waitangi,
  - ? Recognising and providing for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (treasures).
- Te Ture Whenua (Maori Land Act) 1991 establishes certain principles for the way in which Maori may use their lands (including controls on alienation or sale) and other resources, and this affects key strategic management decisions concerning resource protection, use and development in Rotorua.

Options for Action

Option (a): Continue current practices in accordance with legislation.

Option (b): Develop and implement lakes management policy in consultation with the individual hapu of Te Arawa.

Option (c): Establish a management team structure including the direct involvement of Te Arawa as part of the team to create and implement lakes management policy.

Selected option – (c).

Tasks

Task No. 13:	Maintain development of a holistic approach to the management of the lakes of the Rotorua district and their catchments, while at all times maintaining the mauri (life force) of the lakes and the natural balance required to safeguard the life-supporting capacity of the water and the associated ecosystems.
Objective:	In implementing management practice, to maintain a holistic approach, in accordance with tikanga Te Arawa, to avoid compartmentalisation of issues.
Responsibility:	Management team
Public review agency:	Management team reporting annually to Rotorua District Council, Environment B·O·P and Te Arawa Maori Trust Board.

Task No. 14:	Identify and adopt co-management options that are consistent with the existing legislation.
Objective:	Report on co-management options, present options to the community, consider, and implement accordingly.
Responsibility:	Rotorua District Council, Environment B·O·P and Te Arawa Maori Trust Board.
Public review agency:	Management team.

Task No. 15:	Support the resolution of the Arawa Waitangi Tribunal lakes claim and all necessary consequential legislative amendments.
Objective:	To assist integrated management and to remove ongoing uncertainty concerning Te Arawa's role, prepare a report outlining options for facilitating resolution of Te Arawa's claim.
Responsibility:	Rotorua District Council and Environment B·O·P and Te Arawa Maori Trust Board.
Public review agency:	Management team.

Task No. 16:	Investigate co-management single purpose models with indigenous peoples around the world and adopt the model that best provides for Te Arawa's traditional relationship with their ancestral lakes.
Objective:	Report on models examined, recommend a best option and set out the steps to be taken to give effect to it.
Responsibility:	Te Arawa Maori Trust Board, Rotorua District Council and Environment B·O·P.
Public review agency:	Management team.

Task No. 17:	Provide for the preparation of iwi management plans that clearly identify all those matters required to be addressed in terms of the RMA, including but not restricted to: • How best the lakes can be managed to provide for their social, economic and cultural well being; • How to recognise and provide for their relationship with their ancestral lands, water, sites, waahi tapu, and other taonga; • How to have particular regard to their role as kaitiaki;

(Task No. 17 continued):	• How to take into account the principles of the Treaty of Waitangi; • How best to consult, communicate with and report to tangata whenua.
Objective:	Co-ordinate the provision of financial, information, technical and other support to iwi management plans.
Responsibility:	Te Arawa Maori Trust Board, Environment B·O·P and Rotorua District Council.
Public review agency:	Management team.

Task No. 18:	Encourage tangata whenua to establish and link their interests in specific lakes, as well as in the lakes in general, with lakeshore community interests.
Objective:	For each lake, identify hapu and community interest groups and facilitate their working together in the interest of that lake.
Responsibility:	Te Arawa Maori Trust Board and Rotorua District Council.
Public review agency:	Te Arawa Maori Trust Board.

Appendix B - The Lakes

1 Lake Rotorua

Description

Lake Rotorua was formed 140,000 years ago following the eruption of the Mamaku Ignimbrite. It is relatively shallow, shelving to a depth of 26 m west of Mokoia Island. Geothermal inputs enter directly from hot springs emerging along the southern shore and indirectly from water flowing via the Puarenga Stream from the Whakarewarewa and Pukeroa Hill geothermal areas. Lake Rotorua, which has the most densely populated catchment of all the lakes, links with Lake Rotoiti via the Ohau Channel.

The lake and its catchment now

The catchment for Lake Rotorua is 51.8% pasture and 8.1% urban. The water currently has high levels of nutrients, is close to meeting the biomass and clarity targets set for the lake when Rotorua City's sewage discharge was diverted from the lake to the forest, and is safe for bathing. Water quality is improving.

Vision for the lake and its catchment

Business and urban development in the Rotorua district tends to favour the catchment of Lake Rotorua, but that development does not stop residents and visitors using and enjoying the lake safely.

Issues facing the lake

- The impact of existing and future urban development on water quality: septic tank discharges, sewage treatment plant discharges, storm water discharges.
- The impact of existing and future rural development on water quality: septic tank discharges, soakage to ground water from pastoral land uses, run-off to lake water from pastoral land uses.
- The impact of Rotorua District Council's existing "urban fence" for water and sewage services on future development around the Rotorua urban area.
- Provision of public access to the margins of the lake for residents and visitors.

Possible options for addressing the issues

(a) Do nothing, and assume that lake water quality will remain the same or continue to improve due to past actions and that public access to the lake margin is sufficient.

(b) Adopt tailored approaches, and continue existing measures such as the on-site effluent treatment plan and plans for establishing stock-fenced, vegetated buffers along lake and river banks. This option would mean individual assessment of pastoral land uses, septic tanks, storm water provision and access to the lake.

(c) Establish a total allowable limit of nutrients and other relevant contaminants entering the lake from all sources and a management system for allocating it. Take advantage of opportunities to create further reserve and esplanade strips along the lake margins.

Analysis of options

- Option (a) would be unlikely to achieve the vision for Lake Rotorua, as it would not stop future urban and rural development from harming water quality and would not improve public access to the margins of the lake.
- Option (b) would maintain and possibly strengthen existing measures to control nutrient inputs to the lake, but it would be unlikely to limit nutrients enough to sustain the water quality of the lake.
- Option (c) would set an overall limit on nutrients and other relevant contaminants entering the lake. This option would, however, take some time to implement, and could be expensive.

Preferred option: A combination of options (b) and (c), with option (c) replacing option (b) once a management system has been developed.

Recommended actions

- Environment B·O·P in conjunction with Rotorua District Council to commission work on developing a nutrient budget for Lake Rotorua.
- Environment B·O·P to continue, for the time being, implementing and reviewing work on on-site effluent treatment and on banks.
- Environment B·O·P and Rotorua District Council to implement a nutrient budget through regional and district plans.
- Rotorua District Council to take advantage of changes in land use to create further reserve and esplanade strips for public access along the margin of the lake.

2 Lake Tarawera

Description

Lake Tarawera is a large, deep lake located within the south-western section of the Haroharo Caldera, where it was formed and held back by lava flows from the Haroharo and Tarawera volcanoes. Geothermal springs enter the lake on the southern and northern shores. Indirectly the catchment includes five other lakes within the Lake Tarawera 'system'. Lake Rotokakahi drains into Tarawera via Te Wairoa Stream and Lake Okareka does so via the Waitangi Spring. Lake Rotomahana has an artificial overflow to Lake Tarawera that operates only during high lake levels. There are no surface outlets from Lakes Tikitapu or Okataina. However, subsurface flows from these lakes, and from Lake Rotomahana, are believed to drain to Lake Tarawera.

The lake and its catchment now

The Lake Tarawera catchment is 21.1% pasture and 0.7% urban. The water currently has relatively low levels of nutrients, is classified under the *Proposed Regional Plan for the Tarawera River Catchment* as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

The catchment of Lake Tarawera, including Mount Tarawera, is a protected landscape, and activities on and around the lake do not detract from the landscape.

Issues facing the lake

- The impact of existing and future urban development on landscape values and water quality: spoiling the scenery, septic tank discharges.

- The impact of possible future natural hazards on the health and safety of people and property: earthquakes, volcanic events.

Possible options for addressing the issues

(a) Do nothing, and assume that the landscape, water quality and natural hazards will remain the same or improve due to past actions.

(b) Adopt tailored approaches for dealing with each of the individual issues, including:

- applying the landscape controls in the *Tarawera Lakes Zone Variation* to the *Proposed Rotorua District Plan*;

- having Environment B·O·P, in conjunction with the Rotorua District Council, develop a Natural Hazards Strategy, and

- applying the controls on septic tanks in the *Operative On-Site Effluent Treatment Regional Plan*;

(c) recognising that protecting landscape values, preserving water quality and avoiding natural hazards all require low-density development around Lake Tarawera, and adopting a single development approach to deal with all three issues.

Analysis of options

- Option (a) would be unlikely to achieve the vision for Lake Tarawera, as it would not control future urban and rural development to prevent either damage to the landscape from more intensive land use or risks from natural hazards.

- Option (b) would strengthen existing measures to control urban development around the lake, but it would be unlikely to co-ordinate future urban development to protect landscapes, preserve water quality and avoid natural hazards.

- Option (c) would provide certainty about the overall framework for urban development around Lake Tarawera, and could be implemented as part of the *Tarawera Lakes Zone Variation* to the *Proposed Rotorua District Plan* and the review of the *Operative On-Site Effluent Treatment Regional Plan*.

Preferred option: Option (c)

Recommended actions

- Rotorua District Council, in conjunction with Environment B·O·P, to ensure that the *Tarawera Lakes Zone Variation* to the *Proposed Rotorua District Plan* recognises both the landscape values and the natural hazard risks associated with the catchment of Lake Tarawera.

- Environment B·O·P to consider the possible future impact of septic tanks on Lake Tarawera as part of its review of the *Operative On-Site Effluent Treatment Regional Plan*.

3 Lake Rotoiti

Description

Lake Rotoiti is a moderately large and deep lake located in part in the Haroharo Caldera. The eastern basin occupies the caldera and is deeper and distinct from the shallow western basin. Geothermal inputs to the lake are present on the shore and the bed. Lake Rotoiti links with Lake Rotorua via the Ohau channel and to Lakes Rotoma and Rotoehu via subsurface flows.

The lake and its catchment now

The Lake Rotoiti catchment is 23.9% pasture and 1.1% urban. The water currently contains moderate levels of nutrients, and is safe for bathing, except for Okawa and Te Weta Bays, which can be marginal for safe bathing. Water quality is improving.

Vision for the lake and its catchment

After Lake Rotorua, the Lake Rotoiti catchment is the most popular choice for urban development within the Rotorua district, but residents and visitors can still use and enjoy the lake safely.

Issues facing the lake

- The impact of existing and future urban development on water quality: septic tank discharges.
- The impact of existing and future rural development on water quality: septic tank discharges, soakage to ground water from pastoral land uses, run-off to lake water from pastoral land uses.
- The impact of artificially maintained lake levels on the use of lakeside scenic reserves, and the effects of urban septic tanks.
- The need for more recreational facilities around the lake to reduce pressure on the lakeside scenic reserves.

Possible options for addressing the issues

(a) Do nothing, and assume lake water quality will remain the same or continue to improve due to past actions and that the existing lake level is ideal and can continue.

(b) Adopt tailored approaches, including a continuation of existing measures such as the *Operative On-Site Effluent Treatment Regional Plan* and programmed reviews of the lake-level resource consent, to individually address pastoral land uses, septic tanks and problems created by changes in the lake level.

(c) Prevent further development that does not provide full offsets for its nutrient and bacteria contributions in Okawa and Te Weta Bays until septic tank performance can be improved, sewage reticulation is installed or the lake level is reduced; also make increasing the stock-fenced, vegetated buffers along the northern margin of the lake a high priority.

Analysis of options

- Option (a) would be unlikely to achieve the vision for Lake Rotoiti, as it would not control future development in Okawa and Te Weta Bays to prevent the harmful effects of more septic tanks on water quality, and it would not fix the existing water quality problems arising from septic tanks and pastoral run-off.

- Option (b) would maintain and possibly strengthen existing measures to control nutrient inputs to the lake, but it would allow further development in Okawa and Te Weta Bays and on the northern shore of the lake to continue before the existing problems were fixed. Allowing continued development in these areas could harm the water quality.

- Option (c) would allow existing problems to be fixed before further urban development without offsets in Okawa and Te Weta Bays and rural development on the northern shore of the lake. This option would, however, halt further development at Okawa and Te Weta Bays until water quality issues were addressed.

Preferred option: Option (c).

Recommended actions

- Environment B·O·P to attach high priority to implementing the *Operative On-Site Effluent Treatment Regional Plan* in Okawa and Te Weta Bays and to working with landowners to establish stock-fenced, vegetated buffers along the northern margin of the lake.

- Pending water quality improvements, Environment B·O·P and Rotorua District Council to examine the possibility of preventing any further development that does not involve 100% nutrient and bacteria offsets in Okawa and Te Weta Bays through either the water-related regional plan or the district plan.

4 Lake Rotoma

Description

Lake Rotoma was formed by the Rotoma eruption, which created a caldera consisting of two basins, the southern one of which contains a central submerged peak. The northern basin has a maximum depth of 83 m and the southern basin has a maximum depth of 73.5 m. Lake Rotoma drains by subsurface outflows.

The lake and its catchment now

The Lake Rotoma catchment is 22.8% pasture and 1.1% urban. The water currently has relatively low levels of nutrients, will be classified under Environment B·O·P's water-related regional plan as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

Lake Rotoma has the clearest water of all the lakes, and activities on and around the lake do not reduce this clarity.

Issues facing the lake

- The effect of cattle entering the lake for drinking on water quality.
- The effect of existing and future septic tank installations on water quality.
- The need for better recreational facilities around the lake.

Possible options for addressing the issues

(a) Do nothing, and accept existing water quality and recreational facilities.

(b) Have Environment B·O·P prevent cattle and septic tank discharges entering the lake and Rotorua District Council provide adequate facilities for recreation.

(c) Rotorua District Council and Environment B·O·P work together to improve water quality and recreation facilities.

Analysis of options

- Option (a) would not achieve the vision for the lake, as it would not clean up localised pollution from cattle and septic tank discharges and would not adequately provide for recreational use of the lake.
- Option (b) would result in water quality issues being addressed by Environment B·O·P and recreational issues being addressed by the Rotorua District Council. This would be consistent with the Resource Management Act and the Local Government Act.

- Option (c) would require Environment B·O·P and Rotorua District Council to work together on all three issues. This could result in water quality and recreational issues taking longer to address and would not be necessary to achieve resolution of the three issues.

Preferred option: Option (b).

Recommended actions

Environment B·O·P to work with landowners to increase the stock-fenced, vegetated buffers of the lake and to implement the *Operative On-Site Effluent Treatment Regional Plan*. Rotorua District Council to agree with the Rotoma Residents and Ratepayers Association and community on a programme for developing additional recreational facilities for the lake.

5 Lake Rotoehu

Description

Lake Rotoehu was formed at the same time as Lake Rotoiti. The northern arms of the lake are finger-like, and do not exceed 13.5 m in depth. Geothermal springs (Waitangi Soda Spring) emerge on the south-eastern shore and some direct geothermal input may occur in the south-western region. Lake Rotoehu has no surface outlet, but water disappears into a hole alongside the shore in one of the northern arms.

The lake and its catchment now

The Lake Rotoehu catchment is 39.9% pasture and 0.0% urban. The water currently has high levels of nutrients, will be considered for classification under Environment B·O·P's draft water-related regional plan as "natural state 1991", and can be marginal for bathing. Water quality is declining.

Vision for the lake and its catchment

Pastoral land uses do not affect people's ability to safely use and enjoy the lake.

Issues facing the lake

- The impact of existing and future rural development on water quality
- Run-off to lake and stream water from pastoral land uses
- Soakage to ground water from pastoral land uses.

Possible options for addressing the issues

(a) Do nothing, and assume that water quality will begin to improve because of the recent increases in the stock-fenced, vegetated buffers of the lake.

(b) Continue with a voluntary approach to encourage increasing the stock-fenced, vegetated buffers along the banks of the lake and the streams in its catchment, and monitor changes in water quality.

(c) Require owners with land adjacent to the lake and the streams in its catchment to increase the stock-fenced, vegetated buffers along the banks over a set period, for example, five years, and monitor resulting changes in water quality.

Analysis of options

- Option (a) would not achieve the vision for Lake Rotoehu, as it would allow pastoral land uses to continue harming the lake water.
- Option (b) might achieve the vision for the lake, and would have a relatively low cost for landowners, who could choose to increase the stock-fenced, vegetated buffers along the lake and streams voluntarily. Voluntary participation would, however, not guarantee that most or all of the lake and stream edges would be kept as buffers.

- Option (c) would ensure an increase in the stock-fenced, vegetated buffers and achieve the vision for the lake. It would, however, be relatively expensive for landowners, who would be compelled to meet the costs of increasing the buffers along the lake and stream banks on their properties.

Preferred option: A mix of option (b) and option (c), with voluntary action as the first choice and mandatory action as a back-up if monitoring changes in water quality show it to be necessary.

Recommended actions

Environment B·O·P to ensure that its water-related regional plan contains policies and methods to encourage Rotoehu landowners to increase their lake and river buffers voluntarily, with mandatory action if monitoring show it to be necessary.

6 Lake Okataina

Description

Lake Okataina was formed about 7,000 years ago after lava flows from the Mamaku eruptive episode dammed the valley. The lake has two main basins: the southern end is deepest at 78.5 m, with a ridge rising to 50 m before deepening in the northern basin to 65 m.

Geothermal springs occur on the eastern shore. Lake Okataina is believed to drain by subsurface flows to Lake Tarawera.

The lake and its catchment now

The Lake Okataina catchment is 9.6% pasture and 0.0% urban. The water currently has relatively low levels of nutrients, is classified under Environment B·O·P's *Proposed Regional Plan for the Tarawera River Catchment* as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

Lake Okataina and its catchment are preserved and protected to keep them as close as possible to their indigenous natural state.

Issues facing the lake

- Damage to or destruction of indigenous plants and animals in the catchment due to inadequate control of pests.
- Damage to, or removal of taonga from, waahi tapu from a submerged pa site on the lake bed.
- Some areas of the catchment are not protected from further development.
- Noise from powerboats affecting the enjoyment of recreational users who value the peaceful and natural character of the lake.
- Damage to native water ecosystems from trout in the lake.

Possible options for addressing the issues

(a) Do nothing, and assume that the lake is already in as close as possible a condition to its natural state.

(b) Protect the existing environment by controlling plant and animal pests in the existing reserves and restricting further development of unreserved areas, but continue to allow diving, powerboats and trout in the lake.

(c) Enhance the existing environment by controlling plant and animal pests throughout the catchment, working with landowners to protect unreserved areas through covenants, banning diving and powerboats from the lake and preventing further introduction of trout to the lake.

Analysis of options

- Option (a) would not achieve the vision for Lake Okataina and its catchment, as it would allow for development of unreserved areas and would not control the impact of plant and animal pests.

- Option (b) would achieve the vision for the lake and its catchment, but it would not enhance the existing environment by recognising the damaging and taking of waahi tapu from the submerged pa site and the wishes of some recreational users to have one lake reserved for non-motorised activities.

- Option (c) would achieve the vision for the lake and its catchment, and would enhance the existing environment by protecting unreserved areas, waahi tapu and indigenous aquatic ecosystems, while creating a peaceful environment for recreational users who value the natural character of the lake.

Preferred option: Option (c).

Recommended actions

Environment B·O·P and Rotorua District Council to work with landowners on covenanting unreserved land in the Okataina catchment. Rotorua District Council to consider a variation to the *Proposed Rotorua District Plan* to ban diving and powerboats from the lake. Environment B·O·P and Rotorua District Council to work with Department of Conservation on plant and animal pest control in the Okataina catchment. Environment B·O·P and Rotorua District Council to work with Eastern Fish and Game Council on preventing further deliberate introductions of trout to the lake.

7 Lake Okareka

Description

Lake Okareka occupies a valley eroded into the ignimbrite plateau on the western margin of the Haroharo Caldera. After Lake Rotorua, it has the second highest density of human habitation, with the population increasing during summer. Lake Okareka links with Lake Tarawera via the Waitangi Spring, and also by an artificial channel between the two lakes which is used to control levels in Lake Okareka.

The lake and its catchment now

The Lake Okareka catchment is 55.8% pasture and 2.9% urban. The water currently has moderate levels of nutrients, is classified under Environment B·O·P's *Proposed Regional Plan for the Tarawera River Catchment* as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

Lake Okareka is consistently safe for swimming and fishing. Its catchment is a protected landscape, and activities on and around the lake do not detract from the landscape nor from recreational values of the lake and its catchment.

Issues facing the lake

- The impact of existing and future urban development on landscape values and water quality: spoiling the scenery, septic tank discharges.
- The impact of existing and future rural development on water quality: septic tank discharges, soakage to ground water from pastoral land uses, run-off to lake water from pastoral land uses.
- The impact of possible future natural hazards on the health and safety of people and property: earthquakes, volcanoes.
- The impact of fluctuating lake levels on lakeside properties and the effects of urban septic tanks.

Options for addressing the issues

(a) Do nothing, and assume that the landscape, water quality, fluctuating lake levels and natural hazards will remain the same or improve due to past actions.

(b) Adopt tailored approaches for dealing with each of the individual issues, including

landscape controls in the *Tarawera Lakes Zone Variation* to the *Proposed Rotorua District Plan*, grazing controls in the *Proposed Regional Plan for the Tarawera River Catchment*, ongoing increases in the lake and river buffers, greater lake level control, development of a natural hazards strategy by Environment B·O·P in conjunction with the Rotorua District Council and the enforcement of controls on septic tanks in Environment B·O·P's *Operative On-Site Effluent Treatment Regional Plan*.

(c) Recognise that protecting the landscape, preserving water quality, accommodating fluctuating lake levels and avoiding natural hazards all require low density development around Lake Okareka, and adopt a single development approach to deal with all four issues.

Analysis of options

- Option (a) would be unlikely to achieve the vision for Lake Okareka, as it would not control future urban and rural development to prevent the damage more intensive land use could do to the landscape and the risks from natural hazards.

- Option (b) would strengthen existing measures to control urban and rural development around the lake, but it would be unlikely to co-ordinate future development to protect the landscape, preserve water quality, accommodate fluctuating lake levels and avoid natural hazards all at the same time.

- Option (c) would control urban and rural development around Lake Okareka, and could be implemented as part of the *Tarawera Lakes Zone Variation* to the *Proposed Rotorua District Plan* and the review of the *Operative On-Site Effluent Regional Treatment Plan*.

Preferred option: Option (c).

Recommended actions

Environment B·O·P in conjunction with Rotorua District Council to ensure that the *Tarawera Lakes Zone Variation* to the *Proposed Rotorua District Plan* recognises both the landscape values and the natural hazard risks associated with the catchment of Lake Okareka. Environment B·O·P to consider the possible future impact of septic tanks on Lake Okareka as part of its *Operative On-Site Effluent Treatment Regional Plan* review. Environment B·O·P to monitor effectiveness of rules in the *Proposed Regional Plan for the Tarawera River Catchment* to ensure that sedimentation and unwanted nutrients in the water caused by stock are adequately addressed.

8 Lake Rotokakahi

Description

Lake Rotokakahi (the Green Lake) is located within the Okataina Volcanic Centre. The deepest area of the lake is at the western end with a maximum depth of 32 m, while the eastern end is around 20–25 m in depth. Lake Rotokakahi links with Lake Tarawera via Te Wairoa Stream. This is a privately owned lake administered by the Rotokakahi Board of Control.

The lake and its catchment now

The Lake Rotokakahi catchment is 27.8% pasture and 0.0% urban. The water currently has moderate levels of nutrients, is classified under Environment B·O·P's *Proposed Regional Plan for the Tarawera River Catchment* as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

Lake Rotokakahi and its catchment are preserved and protected to keep them as close as possible to their current (1999) natural state.

Issue facing the lake

- Maintaining and enhancing the landscape and natural character of the lake and its catchment.

Options for addressing the issues

(a) Do nothing, and assume that the natural character and landscape of the lake and its catchment will be retained.

(b) Environment B·O·P and Rotorua District Council work together with the Rotokakahi Board of Control, Department of Conservation and landowners to determine what steps can be taken to maintain and enhance the natural character and landscape value of the lake and its catchment.

Analysis of options

- Option (a) would not achieve the vision for the lake, as it would not ensure that the lake is preserved and protected in its existing natural state.

- Option (b) would recognise the private ownership of the lake by local hapu, and would enable the Board of Control to work with interested parties and relevant agencies to maintain and enhance the lake and its catchment.

Preferred option: Option (b).

Recommended actions

Environment B·O·P and Rotorua District Council to work with Rotokakahi Board of Control, Department of Conservation and landowners to achieve the Board of Control's goals for maintaining and enhancing their lake and its catchment.

9 Lake Rotomahana

Description

Lake Rotomahana was extensively modified and enlarged during the 1886 eruption of Mount Tarawera. Lake Rotomahana has the greatest mean and maximum depths of the Rotorua lakes with a maximum depth of 125 m. The lake occupies the site of two former lakes, one of which was an active geothermal centre that still contributes significant inputs to the lake. Three hot springs on the bed of the lake are located to the west of Patiti Island. Water also enters Lake Rotomahana via a stream draining from Lake Okaro. Lake Rotomahana has no surface outflow but appears to drain by subsurface seepage to Lake Tarawera.

The land and its catchment now

The Lake Rotomahana catchment is 41.4% pasture and 0.0% urban. The water currently has moderate levels of nutrients, is classified under Environment B·O·P's *Proposed Regional Plan for the Tarawera River Catchment* as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

Lake Rotomahana is recognised and appreciated as a natural environment for the support of indigenous water plants and animals, and for its natural geothermal features.

Issues facing the lake

- The impact of existing and future rural development on water quality: septic tank discharges, soakage to ground water from pastoral land uses, run-off to lake water from pastoral land uses.
- The impact of exotic plants and animals on indigenous plants and animals in the lake.
- Protection of the natural geothermal features of the lake.

Possible options for addressing the issues

(a) Do nothing, and assume that there is an appropriate balance of pasture and other vegetation in the catchment, that indigenous plants and animals in the lake are not threatened by introduced plants and animals and that the natural geothermal features do not need specific protection.

(b) Environment B·O·P to investigate the impact of exotic plants and animals on indigenous plants and animals in the lake, to work with landowners on further increases in the lake buffers in the catchment and to investigate the need for protection of the natural geothermal features of the lake. Rotorua District Council to consider installing boat-washing facilities at launch points on the lake margin.

(c) Environment B·O·P and Rotorua District Council to work together on investigating threats to indigenous plants and animals in the catchment, increasing the stock-fenced and vegetated lake buffers and investigating the need for protection of the geothermal features of the lake.

Analysis of options

- Option (a) would not achieve the vision for the lake, as it would not recognise the potential for increase in nutrients in the lake water due to the combination of significant geothermal inputs and pastoral farming, and would not ensure protection of the indigenous plants and animals, nor of the geothermal features in the lake.

- Option (b) would be consistent with Environment B·O·P's responsibilities for geothermal management, native water ecosystems, soil conservation and water quality under the Resource Management Act, and with Rotorua District Council's responsibility for providing access to the lake.

- Option (c) would require Environment B·O·P and Rotorua District Council to work together on all issues. This would not be necessary to achieve resolution of the issues and might delay progress on extending the lake buffers and studying the water ecosystem.

Preferred option: Option (b).

Recommended actions

- Environment B·O·P to work with the Department of Conservation and NIWA (National Institute of Water and Atmospheric Research) on threats to indigenous plants and animals in the lake.

- Rotorua District Council to consider installing boat-washing facilities at launch points on the lake margin.

- Environment B·O·P to work with landowners on increasing stock-fenced and vegetated lake buffers in the Rotomahana catchment.

- Environment B·O·P to investigate the need for protection of the natural geothermal features of the lake.

10 Lake Rerewhakaaitu

Description

Lake Rerewhakaaitu lies at the base of the southern slopes of Mount Tarawera. The main body of the lake reaches only 15.8 m in depth, but a small arm extends into a low basin (Awaatua) 31 m deep. There is normally no surface outflow from Lake Rerewhakaaitu. Lake Rerewhakaaitu links with Lake Rotomahana via water seepage from the Awaatua basin to springs in the tributary of a stream flowing into Lake Rotomahana. During periods of high lake level, a drain also takes overflow to the Mangaharakeke Stream, a tributary of the Rangitaiki River.

The lake and its catchment now

Lake Rerewhakaaitu's catchment is 76.7% pasture and 0.0% urban. The water currently contains moderate levels of nutrients, will be classified under Environment B·O·P's water-related regional plan as "natural state 1998", and is safe for bathing. Water quality is improving.

Vision for the lake and its catchment

Lake Rerewhakaaitu is protected by a catchment that has a roughly even mixture of forestry and pastoral land.

Issues facing the lake

- The impact of existing and future rural development on water quality: septic tank discharges, soakage to ground water from pastoral land uses, run-off to lake water from pastoral land uses.

Possible options for addressing the issues

(a) Do nothing, and assume that there is an appropriate balance of pasture and other vegetation in the catchment and that vegetated, stock-fenced buffers are being increased enough to protect the lake.

(b) Continue to encourage voluntary increasing of the margins of the lake and the streams in its catchment, and monitor changes in water quality.

(c) Require the stock-fenced and vegetated buffers of the lake and the streams in its catchment to be increased by all adjacent landowners over a set period, for example, five years, and monitor changes in water quality.

Analysis of options

- Option (a) would not achieve the vision for the lake, as it would not recognise the potential for an oversupply of nutrients in the lake due to the combination of a shallow lake and a predominantly pastoral catchment.
- Option (b) might achieve the vision for the lake, and would have a relatively low cost for landowners, who could choose to increase the buffers of the lake and streams on a

voluntary basis. Voluntary participation would, however, not guarantee that most or all of the lake and stream buffers would be increased.

- Option (c) would ensure an increase in the lake, river and stream buffers and achieve the vision for the lake. It would, however, be relatively expensive for landowners, since they would be compelled to meet the costs of increasing the lake and stream buffers on their properties.

Preferred option: A mix of option (b) and option (c), with voluntary action as the first choice and mandatory action as a back-up if monitoring of changes in water quality showed compulsion to be necessary.

Recommended actions

Environment B·O·P to ensure that its water-related regional plan contains policies and methods to encourage Rerewhakaaitu landowners to increase lake and river buffers on their properties voluntarily, followed up by compulsion if monitoring shows it to be necessary.

11 Lake Tikitapu

Description

Lake Tikitapu (the Blue Lake) is located adjacent to and to the north of Lake Rotokakahi on the western margin of the Haroharo Caldera. The lake is round, with a generally flat bed that reaches a maximum depth of 27.5 m. Lake Tikitapu links with Lake Tarawera via subsurface flows, and there are no surface outflows from the lake.

The lake and its catchment now

The Lake Tikitapu catchment is 3.3% pasture and 0.0% urban. The water currently has low levels of nutrients, is classified under Environment B·O·P's *Proposed Regional Plan for the Tarawera River Catchment* as "natural state 1994", and is safe for bathing. Water quality is stable.

Vision for the lake and its catchment

Lake Tikitapu and its catchment are maintained to keep them as close as possible to their natural state.

Issues facing the lake

- Maintaining and enhancing the natural state of the lake and its catchment.
- The need for better recreational facilities around the lake.

Possible options for addressing the issues

(a) Do nothing, and presume that the existing natural state will continue and that recreational facilities are sufficient.

(b) Allow Rotorua District Council to promote covenant-based mechanisms for protecting the Lake Tikitapu catchment and to provide adequate facilities for recreation.

(c) Have Rotorua District Council and Environment B·O·P work together to address maintenance and enhancement of the lake and its catchment and provision of recreational facilities.

Analysis of options

- Option (a) would not achieve the vision for the lake, as it would not adequately provide for maintenance and enhancement and for recreational use of the lake.
- Option (b) would be consistent with Rotorua District Council's responsibilities for recreation and land use under the Resource Management Act and the Local Government Act, and would achieve the vision for the lake.
- Option (c) would require Environment B·O·P and Rotorua District Council to work together on both issues. This could result in maintenance and enhancement and recreational issues taking longer than necessary to address and would not be necessary to achieve resolution of the issues.

Preferred option: Option (b).

Recommended actions

Rotorua District Council to work with landowners to covenant the bush around the lake. Rotorua District Council also to consult with users on a programme for developing additional recreational facilities for the lake.

12 Lake Okaro

Description

Lake Okaro is a small crater located in the Waiotapu thermal area about two kilometres north of the volcano Maungakakaramea (Rainbow Mountain). A small stream enters the north-west margin of the lake and the Haumi Stream drains the lake from the south-east to join the Waimangu Thermal Valley stream that enters Lake Rotomahana.

The lake and its catchment now

Lake Okaro's catchment is 95.7% pasture and 0.0% urban. The water currently has a high level of nutrients, is classified under Environment B·O·P's *Proposed Regional Plan for the Tarawera River Catchment* as safe for fishing and bathing, and generally meets this standard. Lake Okaro has the poorest water quality of all the lakes included in this report. Water quality is stable.

Vision for the lake and its catchment

Lake Okaro is protected by a catchment that incorporates a roughly even mixture of forestry and pastoral land cover.

Issues facing the lake

- The impact of existing and future rural development on water quality: septic tank discharges, soakage to ground water from pastoral land uses, run-off to lake water from pastoral land uses.

Possible options for addressing the issues

(a) Do nothing, and accept that Lake Okaro has the poorest water quality of all the lakes and is irrecoverable.
(b) Continue with a voluntary approach to encourage increasing the stock-fenced and vegetated buffers of the lake and the streams in its catchment, and monitor changes in water quality.
(c) Require all adjacent landowners to increase the stock-fenced and vegetated buffers of the lake and the streams in its catchment over a set period, for example, five years, and monitor changes in water quality.

Analysis of options

- Option (a) would not achieve the vision for the lake, as it would not recognise the potential for over supply of nutrients in the lake due to the combination of a shallow lake and a predominantly pastoral catchment.

- Option (b) might achieve the vision for the lake, and would have a relatively low cost for landowners, who could elect to increase the buffers of the lake and streams on a voluntary basis. Voluntary participation would, however, not guarantee that most or all of the lake and stream buffers would be increased.

- Option (c) would ensure increase of the lake and stream buffers and achieve the vision for the lake. It would, however, be relatively expensive for landowners, who would be compelled to meet the costs of increasing lake and stream buffers on their properties.

Preferred option: A mix of options (b) and (c), with voluntary action as the first choice and mandatory action as a back-up, depending on monitoring of changes in water quality as a result of voluntary action.

Recommended actions

Environment B·O·P to ensure that its water-related regional plan contains policies and methods to encourage Okaro landowners to increase their lake buffers voluntarily, followed up by mandatory action if monitoring shows compulsion to be necessary.