

# Draft Wetland Action Plan

For the Wellington Region

April 2002



*caring about you & your environment*

This document is a draft. In finalising this draft staff will talk directly with the stakeholder groups outlined in Chapter 5. All comments and questions are welcome and should be directed to:

Melanie Dixon  
Policy Advisor  
PO Box 11 646  
Wellington  
Phone 04-384 5708  
[melanie.dixon@wrc.govt.nz](mailto:melanie.dixon@wrc.govt.nz)

The purpose of this Action Plan is to describe how the Wellington Regional Council intends to address the significant problem of wetland decline in the Region.

It does this by:

- ◆ Describing the current state of the Region's wetlands, their value, and the threats facing them (Chapter 1)
- ◆ Explaining why the Council must act to assist in their recovery (Chapter 2)
- ◆ Proposing a vision for the Region's wetlands to work towards and relevant goals to support the vision (Chapter 3)
- ◆ Outlining the various existing and proposed programmes intended to achieve these goals (Chapter 4)
- ◆ Quantifying the resources need to the implement the programme, and who else might help us. (Chapter 5)
- ◆ Describing the monitoring we will need to undertake to know if we are achieving the results we seek (Chapter 6)

This Action Plan spells out the Council's work programme over the next four years.

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## EXECUTIVE SUMMARY

Wetlands have disappeared from our landscape and at alarming rate. We can estimate that only 7–14% of our original wetlands remain. These remaining wetlands are valuable; not just because of the rich plant and animal life they support, but also because of the role they play in the hydrological cycle, in the maintenance of water quality, as habitat for commercially important species, and as a recreational resource.

Our remaining wetlands are still threatened by:

- Conversion to agriculture or urbanisation;
- Changes to wetland hydrology;
- Construction of roads;
- Weeds and pests;
- Damage caused by stock;
- Pollution of water entering the wetland; and
- The loss of connection with the wider landscape.

The Regional Council proposed enhanced action to protect and restore the Region's wetlands. The Council has responsibilities towards wetlands under the Resource Management Act (1991) and is committed to helping safeguard the Region's biodiversity.

The Council also has a responsibility as the landowner of a number of important wetlands.

The vision of this Action Plan is that the current decline in the number and condition of wetlands in the Wellington Region is *reversed* and that the region supports a full range of wetland types, in a *healthy*, functioning condition.

We can make this vision a reality by making sure:

- Wetlands in good condition are protected from damage;
- Degraded wetlands in the Region are restored; and
- Wetlands are recognised as part of a wider catchment and landscape.

To achieve the vision there are eight key actions we need to take. These are:

- (1) Develop a prioritised inventory of wetlands in the Wellington Region.
- (2) Increase our knowledge of wetlands, and in particular, wetland hydrology.
- (3) Protect and Restore wetlands on land owned or managed by the Council.
- (4) Work in partnership with other agencies to improve Lake Wairarapa wetlands.
- (5) Protect the very best wetlands on private land under the Key Native Ecosystem Programme.
- (6) Provide practical advice and assistance to encourage wetland restoration on private land.
- (7) Provide an effective regulatory bottom line for wetlands
- (8) Monitor our progress towards achieving our vision.

In 2000 the Council made funds available for the care and protection of wetlands. These funds largely provide for the actions outlined in this plan. However, there are additional costs involved in implementing some parts of this Action Plan. The additional funding will need to be considered through the development of the Long-term Financial Strategy (LTFS) and the Annual Plan process.

Reversing wetland decline is not something the Council can do on its own. We've identified a number of groups we'd like to work along side in implementing this action plan. They are:

- Landowners
- Local Iwi
- Interested community Groups
- Local Territorial Authorities
- Wellington Fish and Game Council; and
- The Department of Conservation.

## Chapter 1: The Current State of Wetlands in the Wellington Region.

We know that wetlands are a valuable but threatened part of our landscape. This chapter outlines:

- The history of wetland loss in the Region;
- Why wetlands are valuable; and
- What threats our remaining wetlands face.

### 1.1 The History of Wetland Loss in The Region

The term ‘wetland’ covers all the different kinds of wet habitats where the land is covered in water for some period of time (but the land does not have to be permanently wet). Wetlands occur in areas where surface water collects or where underground water seeps through to the surface. Wetlands include swamps, bogs, salt marshes, shallow lakes and the edges of some of our rivers.

Wetlands have disappeared from our landscape at an alarming rate. Maori lived with, and indeed depended on wetlands for centuries, but since European settlement wetlands have been drained, filled in, used as dumps, and built on. Before the early 1980s such drainage and destruction of wetlands was accepted practice in New Zealand and encouraged by government because it allowed for the expansion of productive farming land. If it were not for the combined efforts of hunters and fishermen, concerned landowners, scientists, and environmentalists, wetlands would now be entirely lost from the Region.

We know that most wetlands in the Wellington Region have been lost. Looking at maps of soil types that developed under wetlands we can estimate that 12% of the Wellington Region, or about 100,000 hectares of the land was covered in wetland. Today, between 7 – 14% of those wetlands remain (the higher estimate includes the open water of Lake Wairarapa).

Most of our historical wetlands were in the flood plains of the major rivers: the Otaki, Waikanae, Hutt, Tauherenikau, Ruamahanga and Whareama rivers. These flood plains were shifting mosaics of riverbed, meanders, ox bows, bogs, swamps, and swamp forest. These wetlands are now almost all gone – and those that remain are no longer fed by the regular flooding of their rivers.

The largest amounts of wetland left in the Region are within the Lake Wairarapa wetland complex. There are also small remnants of the peat bog that once extended in a nearly continuous strip from Paraparaumu to Foxton. Other important wetlands in the Region include the Taupo Swamp at Plimmerton, and the Pencarrow Lakes and their associated swamps.

Some wetlands have been created, but this can never compensate for the loss of natural wetlands. Created wetland only serve adaptable and successful plant and bird species, and there are many wetland types can not be created.

*‘Measuring Up’ - State of the Environment Report for the Wellington Region* states the Council’s knowledge of wetlands is poor. A survey in 1993 suggested that the



average size of wetlands is small (the vast majority are under 30 hectares). About two-thirds of wetlands are in private ownership (this is by number of wetlands, rather than by area).

## 1.2 Why Wetlands Are Valuable

Although the benefits of draining wetlands to gain productive farmland are well recognised, we remain largely ignorant of the economic, social, and environmental costs of wetland destruction. Many people know that wetlands support wildlife, particularly waterfowl, but few recognise their other values, such as their ability to store and cleanse water.

A summary of wetland values is listed in the table below:

Table 1: Wetland Values

|  |
|--|
| <p><b>Healthy fisheries.</b> A number of commercially harvested fish spend some of their lifecycle in wetlands and estuaries. For example, Lake Wairarapa Wetlands support a commercially exploited eel fishery and a recreational fishery (whitebait, flounder, and brown trout). Wetlands are crucial for maintaining whitebait runs in two ways: firstly wetlands provide habitat for the adult whitebait species to live. Secondly, coastal wetlands provide ideal spawning grounds for whitebait species.</p> |
| <p><b>Hunting, sport fishing, and tourism.</b> Thousands of dollars are spent annually by hunters, fishermen, and tourists visiting wetland areas.</p>   |
| <p><b>Cultural Harvest.</b> Maori used for Kapungawha (lake clubrush) for weaving mats, the stems of Oioi (jointed wire rush) for outer thatching on whare because they are very durable, and the stems of Wiwi (<i>Juncus gregiflorus</i>) to tie things together. Flax (Harakeke) and Raupo are also used.</p>   |
| <p><b>Water purification.</b> Wetlands have been described as the world's kidneys. Wetlands are vital to cleansing water, trapping sediment and capturing nutrients from waters that flow through them. In this way, wetlands improve water quality downstream. Removing excessive nutrients reduces the risk of algal blooms and dead zones (areas where no fish can survive) and ensures water is safe for human and stock consumption.</p>  |
| <p><b>Shoreline stabilisation and storm protection.</b> Wetland plants hold soil in place with their roots, absorb the energy of waves, and break up the flow of river currents. It is estimated that an unprotected shoreline erodes four times faster than those that which are protected by salt marshes.</p>   |
| <p><b>Climate control.</b> Wetlands store carbon within their living material (plants) and preserved (peat) biomass. On a global scale, wetland destruction releases carbon dioxide and adds to the Greenhouse effect.</p>   |
| <p><b>Flood damage reduction.</b> By soaking up and storing water, wetlands help prevent flooding. They do this by slowing the flow of water during times of high rainfall so that it can be more easily adsorbed into the soil. Between rainfall, this stored water is released slowly, helping to maintain water flows.</p>  |
| <p><b>Reservoirs of biodiversity.</b> Two-thirds of our native bird species depend on wetlands for at least some part of their lifecycle. They are also home to a huge diversity of animals including mudfish and insects. A disproportionate number of rare species are dependent on these places.</p>  |

Of course not all wetlands have all of the values listed above, although many possess several. Patterson and Cole (1999) calculated the direct value that wetlands provide to the national economy is \$5,673 million (1994 dollars). This an average of \$30,000 to \$40,000 per hectare. We need to be cautious when considering any activity that might damage a wetland because we often do not know what values a particular wetland has.

### **Box 1: Lake Wairarapa and its Associated Wetlands**

No discussion of the wetlands in the Wellington Region is complete without considering Lake Wairarapa. Whilst 53% - 60% of the wetlands of the lower Wairarapa Valley have been lost since human settlement (Moore et al, 1984), the area still contains over half of the wetlands left in the Wellington Region.

A National Water Conservation (Lake Wairarapa) Order was made in 1989. It recognises “that the wildlife habitat created in part as a consequence of the natural fluctuations of water levels, particularly over the eastern shoreline, is an outstanding feature of Lake Wairarapa”.

The Lake Wairarapa wetlands, including the wetland areas surrounding Lake Wairarapa, and Lake Onoke and its associated wetlands, are considered of national and international importance for flora and fauna (Moore et al 1984). Five species of threatened or rare birds (Dabchick, Bittern, Variable Oystercatcher, Banded Dotterel, and Caspian Tern) breed at, and/or regularly use the wetlands, while other threatened species regularly or occasionally visit (e.g. Wrybill), (Lake Wairarapa Management Guidelines 1991, Department of Conservation).

The eastern lakeshore is also an important habitat for native turf plant communities. Turf plants are very short plants that grow on the water’s edge and provide excellent habitat for wading birds. A number of the wetland plants are nationally threatened or rare in the North Island, e.g. *Leptinella maniototo*, *Crassula ruamahanga*, *Carex cirrhosa*, *Pilularia novae-zelandiae*, *Hypsela rivalis*, and *Amphibromus fluitans*.

The Lake Wairarapa wetlands have traditionally been important for the Ngati Kahungunu people as an area for food gathering, especially eels, and the Lake shoreline has a number of historical sites.

Lake Wairarapa is an integral part of the Lower Wairarapa Valley Development Scheme. In large floods the Lake is used as a storage reservoir. At high flows in the Ruamahanga River, excess river water is directed into Lake Wairarapa via the Oporua Floodway.

Lake Wairarapa water levels are controlled by the Blundell Barrage Gates. These link the Lake with the lower Ruamahanga River. Choosing appropriate water levels for Lake Wairarapa was contentious in the 1970s and early 1980s. A consultation group comprising landowners, South Wairarapa District Council, Department of Conservation, Wellington Regional Council, Fish & Game, Iwi, and recreationists, developed a lake level policy. This has operated well.

**Box 2: The Kapiti Coast. The Great Swamp**

Five thousand years ago the sea level was higher. Waves crashed at the base of cliffs that now form the Paekakariki Scarp. As the waves retreated, the wind formed a series of dunes on the uneven former seabed surface. These sand dunes trapped water – this eventually created a series of lakes and swamps behind and amongst the sand dunes

Prior to clearance and drainage, the Kapiti Coast was cloaked in swamp forest, dominated by tall trees such as kahikatea, pukatea, swamp maire and rimu. There were extensive areas of flax swamps and a number of lakes fringed with sedges, rushes, and cabbage trees. It was so wet that the area from Paraparaumu to Foxton was referred to as the ‘Great Swamp’. Centuries of growth of wet forests developed a deep fertile soil on all but the young sand dunes.

The component of the swamp in the Wellington Region covered almost 2,000 ha but now is represented by small, heavily modified remnants, totalling less than 300 hectares.

### 1.3 What Threats Do Our Remaining Wetlands Face?

Our remaining wetlands are vulnerable. The threats are listed below:

#### 1.3.1 *Conversion to Agriculture or Urbanisation*

The decision of the Government in the mid-1980s to end government subsidies for irrigation, flood control, and drainage schemes has slowed the pressure on wetlands (Ministry for the Environment, 1997). Wholesale drainage and filling has stopped. However, it is likely that we will continue to lose small wetlands and small corners of larger wetlands, and the cumulative effects of this are high. At this stage we do not know how much of this is happening in the Region, because wetland extent has not been monitored.

#### 1.3.2 *Changes to Wetland Hydrology*

Wetlands are vulnerable to changes in their *hydrological regime*. That is changes to water levels and the natural cycle of flooding and drying. Most changes to wetland hydrology result in the wetland either drying up or being permanently flooded. This creates habitats that are similar over larger areas for long periods, reducing diversity. Fluctuating water levels encourages diversity.

Activities that damage wetlands by changing their hydrological regime include:

- Drainage, including the deepening of nearby drains, which can lower the water table in wetlands. The drainage of one boggy paddock can lower the water table in a nearby wetland if they are connected by groundwater;

- Road runoff discharging into a wetland can scour out a channel through the wetland. Channels in wetlands reduce water levels;
- Flood protection works such as the use of stopbanks that isolate rivers from their flood plains. Stopbanks stop the regular flooding of flood plain wetlands; and
- The over-extraction of groundwater from bores which leads to lowered water levels in wetlands connected to that groundwater body.

The potential for these activities to damage wetlands is often difficult to predict because we have limited information on the hydrology of wetlands in the Region.

### 1.3.3 *The Construction of Roads*

Roads have been built through wetlands because they have been perceived as low value areas. Some of the effects that roads have on wetlands are:

- Sedimentation during road construction;
- Changing water flows by creating a barrier for water that would have otherwise flowed through the wetland;
- Contamination via polluted sediments washed into the wetland with stormwater; and
- Road noise which may affect sensitive bird species.

Wetlands remaining along the Kapiti Coast are particularly vulnerable to roading construction. Current projects that will affect wetlands are the State Highway One upgrade and the proposed Western Link Road from Raumati to Waikanae.

### 1.3.4 *Weed and Pests Impacts*

Wetlands can be invaded by aggressive, non-native vegetation, such as grey willow, tall fescue and Japanese honeysuckle. Weeds in wetlands can replace native plants and change water flow and quality. Degraded wetlands are more vulnerable to weed invasion, but even pristine wetlands can be invaded and altered by some weed species.

Wetland and aquatic weeds are increasing in area in the Wellington Region. New weeds are establishing and established weeds are increasing in area. For example, the highly aggressive aquatic weed hornwort has recently invaded the Lake Wairarapa wetlands. The growth and spread of this species is extremely rapid with the result that the natural flow of water is altered, light cannot penetrate water in lakes and oxygen is stripped from the water. Weed problems at Lake Wairarapa include the invasion of rare 'turf' plant communities on the eastern shoreline elder and tall fescue.

Mustelids and other animal pests can greatly reduce wetland bird numbers. Exotic fish have big impacts on lakes. Fish such as kio carp feed on plants growing on the bottom of the lake bed and stir up the water making it more turbid. On the margins of wetlands, and in wetlands that are dry over summer, possums, hares and rabbits can cause major damage to native vegetation.

### 1.3.5 *Damage Caused by Stock*

Grazing livestock can degrade wetlands that they use as a food and water source. Livestock eat wetland vegetation and trample and pug wetland soils. Their dung and urine leads to increased nutrient levels. Wetland margins and wetlands that dry out naturally over summer are particularly vulnerable. For example, during the particularly dry summer of 2000/2001 some wetland vegetation on the margins of the Pencarrow Lakes was destroyed by stock damage.

### 1.3.6 *Pollution of Water Entering the Wetland*

Although wetlands can remove pollutants from a system, their capacity to do so can be exceeded. Whilst wetlands can remove excessive nutrients and sediment from water high levels of these pollutants causes damage.

Low nutrient wetland types, such as bogs, are particularly vulnerable to the impact of nutrients. Wetlands that are naturally higher in nutrients are less vulnerable to increased nutrient levels but even in these areas excessive nutrients promotes aquatic weed invasions, and may cause excessive growth of some native species such as raupo which can replace areas of open water.

Wetlands trap and hold sediment that is washed into a wetland. In areas of high erosion where the water carries a high sediment load this speeds up the rate at which the wetland is in-filling (going through a transition to dry land).

### 1.3.7 *Loss of Buffers and Connections*

The animals that live in wetlands often need vegetated margins, for example, for nesting sites. Vegetated margins can also shelter the wetlands from prevailing winds. On a larger scale, wetlands need connections to forest along vegetated forest corridors. Few wetlands have intact vegetated margins and corridors of vegetation (for example, vegetated riparian areas) to 'link' them with the landscape.

## Chapter 2: Why the Council Must Act To protect and Restore The Region's Wetlands

This chapter discusses why the Regional Council must act to protect and restore wetlands. In summary, this is because of the Council's:

- responsibilities under the Resource Management Act 1991 (RMA);
- wider commitment to Region's indigenous biodiversity;
- adoption of an ecosystem-based approach to freshwater management; and
- responsibility as the landowner of a significant wetland resource.

### 2.1 Council Has Responsibilities Under The Resource Management Act (1991)

The preservation of the natural character of wetlands, and their protection from inappropriate subdivision, use and development is a matter of national importance under section 6(a) of the RMA.

There are two main ways that authorities implement this part of the Act. They are by:

- Adopting *regulations* to control the activities that affect wetlands; and
- Using *non-regulatory* methods (such as providing education, motivation, advice and incentives) to encourage voluntary action.

Through methods in the Regional Policy Statement (RPS) the Council has chosen to emphasise a *non-regulatory* approach, such as raising public awareness and providing advice and assistance to landowners who are protecting wetlands. The Council has recognised that more can often be achieved by working with landowners than by relying solely on regulation to protect wetlands. This Action Plan is a key part of the development of the Council's non-regulatory approach and will meet the Council's commitments in the RPS (Freshwater Method 48) and in the Freshwater Plan to develop a Wetland Strategy.

The responsibility for *regulating* activities that affect wetlands is shared between the Regional Council and territorial authorities. Rules in District Plans control land uses, although the Regional Council does control vegetation removal and soil disturbance on erosion prone land. Regional rules can regulate diversion of water (both over and under the ground), and the reclamation of river and lakebeds.

The complementary roles of the Regional Council and territorial authorities for the "wet" and "land" parts of wetlands mean that we must work together closely to achieve integrated management of wetlands.

### 2.2 Wetlands as Part of a Wider Commitment to the Region's Indigenous Biodiversity

The Council is undertaking a broad programme of biodiversity management to help protect ecosystems. Much of the funding in this programme is devoted to the management and reduction of plant and animal pests from areas of high ecological value (largely bush area but also wetlands, escarpments and dunes). Funds are also

being applied to marine ecosystem management, and to the freshwater environments. The Council spends about \$1.3 million on this programme per year.

Activities in the Council's biodiversity programme that benefit wetlands include:

- Pest control;
- Support for QEII covenanting;
- Iwi Project Funding;
- Riparian Management Programme;
- Freshwater Ecosystem Programme, and
- Take Care Community Action.

### 2.3 **The Council has Adopted an Ecosystem-based Approach to Resource Management.**

The Council signalled its intention to take an ecosystem-based approach to managing the environment in its RPS. A general description of the outcomes sought is:

- The overall quality (health) of ecosystems is increased (by strengthening key processes);
- Healthy functioning ecosystems are distributed throughout the Region, including the rural and urban environments;
- The area and quality of indigenous ecosystems is increased;
- The Region has a diversity of healthy ecosystems which represent the full range of regional flora, fauna and habitats; and
- Special ecosystems are actively protected and appropriately managed.

#### 2.3.1 *The Importance of Ecological Processes*

What is the Council's "ecosystem approach"? All living things are a part of complex, interacting webs, or systems that are powered by natural processes and cycles (e.g. the hydrogen, carbon and nitrogen cycles, photosynthesis, energy flows and decomposition). An ecosystem approach to resource management means attempting to sustain and support these processes by managing water, land, air, plants and animals, in ways that help these wider systems function in a healthy and viable manner.

This type of management is different from our earlier efforts to control discrete parts of the environment, such as the quality of water in a river or the conservation of soil on an eroding hillside, in isolation from the ecosystem of which they are a part. This separation was often for an economic or human reason alone. An ecosystem approach means managing a system of interacting parts, not just a discrete area or species. If a single part does require management, it means doing so in a way that increases its contribution to the health and viability of the wider system, as well as ensuring its own viability.

Sustaining ecological processes is important in all places, from relatively pristine areas to urban and agricultural landscapes. It is just as important on private land, as well as

in publicly owned parks and reserves. Of course, our ability to fund the right sorts of support for these processes is limited and will necessitate some priority setting.

### 2.3.2 *Places*

As well as processes, the Council's ecosystem approach places an emphasis on certain types of ecosystem because of their rarity or absence from the protected lands in the Region. These are:

- Wetlands;
- Lowland bush;
- Estuaries;
- Dunes;
- Escarpments;
- Rivers and lakes; and
- Marine ecosystems.

There are many places in the Region where ecosystems of these types need help to make them sustainable. The Council recognised this in 2000 and allocated significant additional funding to increase the management in these places.

Freshwater environments feature prominently on this list because of the marked loss of wetlands and the poor quality of many of the Region's streams and rivers.

## 2.3 **Implications for Freshwater and Wetland Management**

Rivers and wetlands are complex ecological systems that exist in a constant state of flux, over time and space. To take an ecosystem approach to their management is to identify the ecological processes occurring within them, the key characteristics that enable them to function successfully, and the ecological functions they perform within the wider landscape. Some of these functions might be the hydrological cycle, the nutrient cycle, sediment removal, habitat for animals, fish, birds, and plants, their levels of diversity, the presence of plant and animal pests, and so on. While it will not be possible to chart all of these (there is much about the functioning of ecosystems we do not yet understand), once we have identified the major ones, we can make choices about which processes or characteristics we will support or attempt to manage.

The Council's decision to put a greater emphasis on rivers and wetlands means that there are now programmes of work devoted to these ecosystems. For rivers, considerable effort is going into understanding how the Region's rivers function as ecosystems, and improving our understanding of the species that live in them. A Riparian Strategy was released for public consultation in July 2001. The strategy proposed ways to manage the Region's riparian areas so that they can help in the functions of the streams' ecosystems (e.g., nutrient inputs reduced, temperatures reduced, carbon inputs returned to more natural levels etc).

For wetlands, this Action Plan spells out the Council's programme over the next four years, and the funding necessary to implement that programme.



## 2.4 Responsibility as a Landowner of a Significant Wetland Resource

The Council is responsible for protecting and restoring wetlands on land owned or managed by the Council and has recognised the need to do so in the RPS (Method 48). Reversing wetland decline in the Region will not be possible without action on our own land. Council investment in protecting and restoring wetlands on Council land will:

- Protect some significant wetlands in good condition (including Pencarrow Lakes and wetlands, Orongorongo wetland);
- Restore some important wetlands (including wetlands at Queen Elizabeth Park, Pakuratahi Ladle Bend Wetland, and the Otaki River Mouth);
- Demonstrate wetland restoration techniques to the public that can be applied on private land (Battle Hill wetland); and
- Provide opportunities for community involvement in wetland restoration (Queen Elizabeth Park).

This work will strengthen the Council's position when encouraging wetland restoration on private land.

These same actions described above apply to Lake Wairarapa. Although the Council does not own all of the land surrounding Lake Wairarapa we do control the water levels and thus exert the major influence over the system.

## Chapter 3 Vision, goals and key actions

The vision of this Action Plan is that the current decline in the number and condition of wetlands in the Wellington Region is *reversed* and that the region supports a full range of wetland types, in a *healthy*, functioning condition.

The focus on a range of wetland types is important as the term wetland covers a number of different wet habitats (for example, swamps, bogs, estuaries, ephemeral wetlands, alpine wetlands, and shallow lakes).

We can make this vision a reality by breaking it into a number of smaller and more achievable goals. They are as follows.

### 3.1 **Goal 1: Wetlands in good condition are protected from damage**

It is easy, quick and cheap to damage natural wetlands. It is hard, slow and expensive to return them to their original state. Usually we are not capable of returning wetlands to anything approaching the subtlety and complexity of a natural system. For this reason the highest priority must be to avoid further damage to wetlands, especially those wetlands that remain in good condition.

Focusing on protecting the best wetlands does not mean that we should stop supporting the restoration of more degraded wetlands (for example, supporting a care group that is restoring an urban wetland). It just means that these activities should not occur at the expense of protecting wetlands in good condition.

We must identify wetlands in the Region in good condition on public and private land and make every effort to ensure that they are protected from damage.

### 3.2 **Goal 2: Degraded wetlands in the Region are restored**

Unfortunately, very few wetlands in the Wellington Region are free from weeds and pests or fenced from stock. Some have had changes to their natural cycles of wetting and drying. Therefore, most wetlands need active restoration. It will not be possible to restore most wetlands to pre-human condition – but we can aim for healthy, functioning wetlands. To restore wetland health we need to start by restoring the wetland's natural hydrological regime (e.g. filling in drains), fencing, replanting, and controlling weed and pests.

Wetland restoration is preferred over creation because putting a wetland where it did not exist before is difficult and not always successful. Some wetland types (such as low nutrient bogs that take hundreds of years to develop) cannot be created.

### 3.3 **Goal 3: Wetlands are recognised as part of a wider catchment and landscape**

Achieving our vision for wetlands means more than simply fencing off the ones that remain. Wetlands are part of large ecological and hydrological systems, and cannot be

managed in isolation. Wetlands are vulnerable to long term changes to their *hydrology*. It is the hydrology (that is, the amount and timing of water entering the wetland via ground water or overland flow) that determines whether a wetland remains a wetland or becomes dry land, supporting dry land plants and animals. Changes to wetland hydrology can be caused by activities well beyond the wetland's surface boundary, for example the over use of groundwater. Restoration activities such as fencing, weed control, pest control and replanting can be doomed to failure if the hydrology has been altered and cannot be restored.

In many areas we simply do not understand the wetland's hydrology. Without this knowledge we cannot restore wetlands.

Beyond hydrology there are many other influences on wetlands outside their boundaries. For example, if there are barriers to fish passage downstream of a wetland there may be no fish even though the wetland provides good fish habitat.

**To achieve these goals there are eight key actions we need to take. These are:**

- (1) Develop a prioritised inventory of wetlands in the Wellington Region;
- (2) Increase our knowledge of wetlands, and in particular wetland hydrology;
- (3) Protect and Restore wetlands on land owned or managed by the Council;
- (4) Work in partnership with other agencies to improve Lake Wairarapa wetlands;
- (5) Protect the very best wetlands on private land under the Key Native Ecosystem Programme;
- (6) Provide practical advice and assistance to encourage wetland restoration on private land;
- (7) Provide an effective regulatory bottom line for wetlands; and
- (8) Monitor our progress towards achieving our vision.

## Chapter 4: What Action Will We Take To Meet The Vision?

This chapter outlines how the Council intends to meet the vision and goals described in the previous chapter. The Council has already made a commitment to wetlands and has a number of projects underway. This Action Plan proposes building on this commitment and outlines the current and proposed projects to meet these goals under each key action.

### 4.1 Develop a Prioritised Inventory of Wetlands in The Wellington Region.

At the moment information on the Region's wetlands is scattered among databases in different organisations and much of the information is out of date. The first step is for all available information to be collated in order to create a concise database. This project will be completed by the end of June 2002.

Next year we plan to visit all these wetlands and record information on wetland extent and condition. Wetlands on private land will not be visited without permission from the landowner. Contacting wetland owners will be used as an opportunity to promote the Wetland Advisory Service.

Once completed, this database will be used to prioritise wetlands in the Region and it will be maintained to monitor wetland extent and condition.

### 4.2 Increase our Knowledge of Wetlands, and in Particular Wetland Hydrology.

We do not have enough information on wetland extent to allow us to reassess, in a few years, if wetland decline is reversed. We also have limited information on wetland health. This lack of information was highlighted in 'Measuring Up', our latest State of the Environment report.

Developing and maintaining a wetland database will help address this knowledge gap, however, additional knowledge is needed on wetland hydrology as this is the main driver of wetland processes. Understanding wetland hydrology is vital to achieving the goal of a catchment based approach to reversing wetland decline.

Information on wetland hydrology is needed in the following areas:

- Shallow Water Aquifers on the Kapiti Coast:

Most wetlands on the Kapiti Coast are groundwater fed. With increased pressure on the Kapiti Coast groundwater resource, we need to understand how wetlands in this area function, so we can ensure their survival. This work does not require the allocation of any additional resources.

- Understanding the hydrology of the most important wetlands:

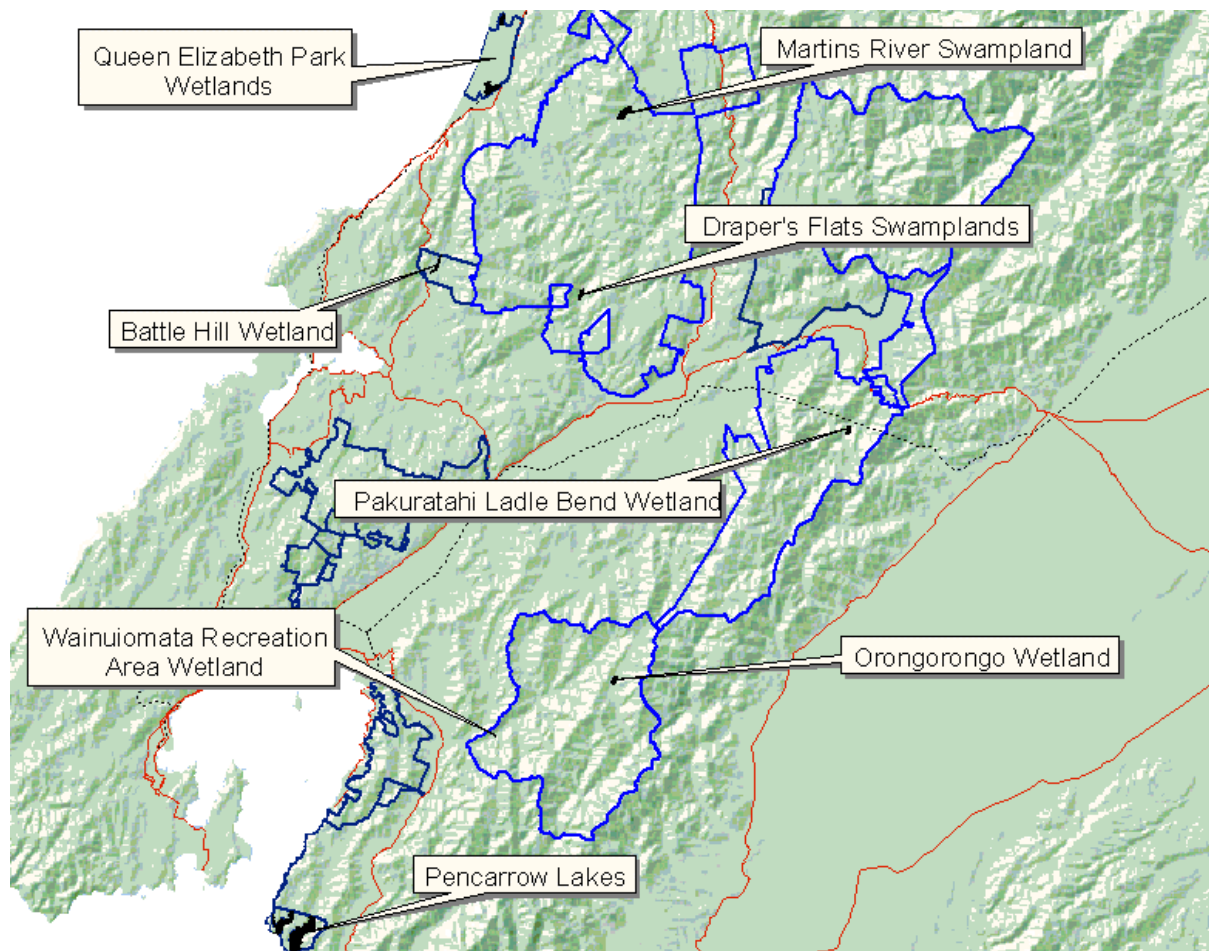
For our best remaining wetlands we need long term hydrological monitoring. Hydrological studies are needed on all wetlands proposed as Key Native Ecosystems before any restoration activities are undertaken. The following

significant wetlands, whose hydrology is not understood, could potentially be under threat from changes in ground water or surface flow:

- Taupo Swamp, Plimmerton;
- Pritchards Swamp, Otaki; and
- Waingawa Freezing Works, Masterton.

#### 4.3 Protect and Restore wetlands on Land owned or Managed by the Council

Wetlands on Regional Council land include some of the most important wetlands in the Wellington Region. The major wetlands are illustrated in **Figure 1**.



These wetlands cover a variety of different types, from ephemeral wetlands at Queen Elizabeth Park, to a high altitude wetland at Orongorongo valley, and a rain fed bog at Pakuratahi. In the case of the Pencarrow Lakes and wetlands, which are considered to be of national importance, only parts of the area are under control of the Regional Council.

The wetlands on Council land can be categorised as follows:

- Wetlands in good condition. Small effort needed to keep wetland in good condition. (Orongorongo Wetland)

- Wetland in good condition. Large effort needed to keep wetland in good condition. (Pencarrow Lakes and associated wetlands, Ladle Bend wetland)
- Wetlands in bad condition. Active restoration (large effort) required to improve condition. (Queen Elizabeth Park, Battle Hill Farm Forest Park, Wainuiomata Recreation Area wetland, Otaki River Mouth)
- Wetlands we do not know enough about to assess their importance and their condition (Akatarawa Forest Park Wetlands).

Although protecting the best wetlands on Regional Council land is the top priority, restoring degraded wetlands on Council land is a vital part of the Council's response to wetland decline in the Region. Wetland restoration (especially in areas that are accessible to the public) provides opportunities to demonstrate restoration techniques to private landowners, and opportunities to involve the wider community. Wetland creation on Council land is not a priority.

Appendix 1 contains detailed information on each wetland and the actions necessary to protect or restore them.

#### 4.4 **Work in Partnership with other Agencies to Improve Lake Wairarapa Wetlands**

Lake Wairarapa Wetlands form the largest wetland complex in the southern North Island. There has been a lot of modification in the area over the last 150 years by:

- uplift of the former lake bed in the 1855 earthquake;
- drainage for agricultural development;
- the diversion of the Ruamahanga River in 1967; and
- the introduction of exotic plants and animals.

Despite this history of modification, the area is considered to be of international importance because of the unique plant and animal life it supports. Relatively few people visit Lake Wairarapa because developed access points are limited. Nevertheless, Lake Wairarapa is regionally important for game bird hunting, fishing, and nature study.

The number of landowners of the Lake Wairarapa Wetlands complicate their management. The Department of Conservation (DOC) administers most of the wetland complex. Other parts are administered by:

- *Private landowners.* Some, like the Pearce Wetlands, have conservation covenants on their title.
- *Wellington Fish & Game Council.* Their land is at the north end of the Lake and they administer and control water levels in some of the wetlands on the Eastern side of the Lake for recreational hunting.
- *South Wairarapa District Council.* Administer the Lake Reserve area at the Featherston end of the lake.
- *The Regional Council.* The Council owns land associated with the Oporua Floodway on the eastern side of Lake Wairarapa, and is responsible for controlling water levels through the operation of the Barrage Gates under the terms of the resource consent.

River flows and lake levels that affect the Lake Wairarapa wetlands are primarily managed for flood protection purposes as part of the Lower Wairarapa Valley Development Scheme. The target levels have been set by a committee of interested parties including lakeshore farmers, iwi, and DOC. The lake acts as a flood storage area in large floods with river flows being directed to the lake via the floodway system. A subcommittee of the Wellington Regional Council oversees the Scheme's physical and financial management. This subcommittee is made up of elected Scheme ratepayers and representatives from the Wellington Regional Council and the South Wairarapa District Council.

Discrete parts of these wetlands are managed for other reasons, including providing opportunities for recreational hunting, and the conservation of the areas unique plant and animal life. Other interests include cultural harvest, and commercial/recreational fishing.

DOC has tried to address the lack of co-ordination in the management of the Lake Wairarapa Wetlands by convening the Lake Wairarapa Co-ordinating Committee. The Committee produced the 'Lake Wairarapa Management Guidelines' in 1991 and now meets annually.

The Regional Council has allocated funds in 2005/2006 to set up a new Regional Park based on the eastern shoreline of Lake Wairarapa.

#### ***What we are doing now***

- Investigating fish passage through the barrage gates

DOC has expressed concern about the impact of the Barrage Gates on the ability of fish to enter Lake Wairarapa. To address this, the Regional Council and DOC are completing a fish-sampling programme every spring and autumn. During the survey the gates are opened daily at high tide for one hour. This data will be collected and analysed over 3-4 years to establish any trends.

- Restoring wetlands on the Oporua Spillway

The Wairarapa Operations Department has undertaken wetland restoration on the Oporua Spillway. This has involved retiring lower lying land on the spillway from grazing.

- Monitoring the Lake margin.

Changes in the Lake vegetation and profile are monitored along transects that were set up by the Wairarapa Catchment Board in 1985.

- Monitoring water quality in Lake Wairarapa

#### ***What we would like to do***

- Work with DOC and the Fish and Game Council to assess the condition of the wetlands around Lake Wairarapa, and rank them in order of importance for

management. This assessment should pay particular attention to the hydrology of the wetlands. In some cases it may be possible to alter the water levels and water level fluctuations to improve wetland health (for example, creating a more dynamic fluctuations in water levels may kill weeds).

- Boggy Pond Wildlife Reserve;
  - Mathews Lagoon Wildlife Reserve;
  - J K Donald Wildlife Reserve;
  - Haywoods Lakes;
  - Bartons Lagoon;
  - Turners Lagoon;
  - Simmonds Lagoon;
  - Turanganui Pond;
  - Steep Hill Lagoon;
  - Lake Onoke;
  - Domain Lagoon;
  - Domain Board Wetland; and
  - Floodway Lake.
- Prepare a Management Plan for the wetlands listed above dependent on their ranking and in association with the appropriate authority.
  - Continue research into the impact of the barrage gates on the wetlands.
  - Continue sampling the water quality in Lake Wairarapa. A sampling programme may be needed for adjacent wetlands, subject to the assessment of wetland health.
  - Continue to monitor the shore line profile.
  - Explore ways of involving the community in activities at Lake Wairarapa.
  - Continue development of the wetland potential within the Oporua Floodway.

Irrespective of whether the Regional Park proposal succeeds, we would like more regular contact with the Department of Conservation and other agencies involved in active management at Lake Wairarapa. Our actions will be carried out with input from the Lake Wairarapa Co-ordinating Committee and the groups it represents.

#### 4.5 **Protect the Very Best Wetlands on Private Land Under the Key Native Ecosystems Programme.**

Key Native Ecosystems (KNE) are areas of native bush, dune vegetation, or wetlands on private land that are vital to the long-term viability of the Region's unique plant and animal life. Under the KNE programme Council can help landowners manage these areas. The KNE programme is voluntary, and landowners must have a conservation covenant in place to receive Council assistance.



When the programme began in 1996, all KNE were native bush, and the chief management activity was possum control. This year (2001/2002) is the first year that other ecosystems have been included. There are now two wetland KNE sites:

- Te Harakeke Swamp (Waikanae); and
- Lake Pounui (South Wairarapa).

At these sites, the Council is funding fencing upgrades, weed control and studies into wetland hydrology and ecology to aid management decisions (such as whether weirs need to be constructed to increase water levels).

Several more wetland KNE sites need to be added to the programme to ensure that regionally important wetlands sites are protected as part of this programme. As part of the term of this Action Plan three more wetland KNE sites will be added to the programme over the next four years. Further wetlands will be added to the programme after June 2006.

As the sites included in the wetland KNE programme are of regional significance the benefit in protecting these is shared by the Region as a whole. Therefore the Council will provide 100% funding provided the landowner has covenanted the site.

#### 4.6 **Provide Practical Advice and Assistance to Encourage Wetland Restoration on Private Land**

##### 4.6.1 *The Wetland Advisory Service*

The Regional Council currently provides some advice on wetland restoration on private land since June 2000 under the Wetland Advisory Service. Its purpose is to provide advice about how to restore natural wetlands. The service is aimed at landowners and other groups interested in restoring wetlands. The Wetland Advisory Service has not been advertised and most landowners learn about the programme through contact with Council staff on other related matters. In 2000/2001 seven different landowners or groups were given advice on wetland restoration, and so far in 2001/2002 nine more landowners have been involved in the programme. The Wetland Advisory Service is run from the Resource Policy department of the Regional Council.

The consultation that Council undertakes on this draft will guide the further development of the Wetland Advisory Service, however, this is what is proposed:

- Providing advice

As a minimum all landowners of wetlands will have a Wetland Management Plan prepared free of charge on request. This will involve a site visit with the landowner, and include technical, site-specific advice such as weed control and planting programmes.

To support this programme we also intend to develop a number of technical fact sheets on wetlands that can be used by private landowners and groups restoring wetlands.

- Providing financial incentives

For wetlands that do not qualify as regionally important, private landowners will be able to apply for up to 50% of the funding necessary to implement their Wetland Management Plans. A maximum of \$5,000 in any one year and \$10,000 per project is suggested, with the Council reimbursing costs at the works completion.

There will be no funding round. Incentives will be given on a 'first-in-first-served basis'. These incentives would be available to individual landowners, or groups of landowners.

\$50,000 per year has already been set aside for this incentives programme and the development of the Wetland Advisory Service. In 2002/2003 most of this money will be spent on development of resources with more funds spent on incentives in the following years.

#### 4.6.2 *Other community programmes that contribute to wetland restoration on private land*

##### a). *Iwi Projects Funding*

In 2001/2002, it is likely that two proposals from Iwi to restore wetlands will be supported by the Iwi projects budget, both in the Wairarapa (Ngawi and Homewood).

Iwi projects to restore wetlands can be supported through the Iwi Projects Funding in future years if proposed by Iwi.

##### b). *Continuing the Take Care – Community Environmental Care Programme*

The Council supports community groups working on restoring parts of their local environment. Assistance is only given to groups working on rare or unprotected ecosystems, including wetlands, and riparian and coastal dune areas. Groups working on wetland restoration projects supported by the Council are:

- Queen Elizabeth Park group (restoring wetlands in the Park);
- Te Horo Beach Residents Association (restoring the Mangaone coastal wetland);
- Waimeha Restoration Group (working on the Waimeha lagoon);
- Forest and Bird Fensham Group (restoring the Fensham wetland near Carterton);
- Manuka Street Residents Association (improving a wetland and stream in Masterton); and
- Pauatahanui Wildlife Reserve Group (creating a freshwater wetland at Pauatahanui).

Wetland projects will continue to be a priority for Council support, through the Take Care Programme.

c). *Council's Support for the QE II National Trust*

Council provides funding for the QE II National Trust to increase the amount of private land in the Region that is covenanted. Of the 22 covenants supported since June 2000, four have been wetlands.

d). *Connection with the Riparian Strategy*

There is a strong connection between this Action Plan and the strategy for riparian management currently being prepared by Council. Wetland seeps that flow into small streams are part of the riparian environment. Fencing and planting such seeps helps them remove nutrients from the water before it reaches into the stream. Protecting wetland seeps can be encouraged by the subsidises that will be decided under the Council's Riparian Strategy.

#### 4.7 **Provide an Effective Regulatory Bottom Line for Wetlands**

Rules in the Regional Freshwater Plan provide the regulatory framework for activities that affect wetlands. Rule 16 requires a water permit to take, use, dam, or divert water in or from a wetland unless the diversion is allowed by Rule 8 or Rule 9. Rule 18 provides a higher level of control for some of the more important wetlands, the majority of which are owned by the crown. To date, the Council has only received and approved six applications to divert water from a wetland.

Many other activities such as the discharge of stormwater, an increase of impervious surfaces in the catchment and the use of groundwater can effect wetlands. The Council needs more information about how these activities are affecting wetland health to ensure that the limits in the Regional Freshwater Plan on water are adequate to allow natural processes in wetlands to continue. This information needs to be collected now to check whether any changes are needed in the Freshwater Plan when it is reviewed.

## **Chapter 5: What Resources are Needed and Who Else Might Help Us.**

This chapter describes the resources needed to implement the actions described in the previous chapter. In 2000 the Council made funds available for the care and protection of wetlands. These funds largely provide for the actions outlined in this plan. However, there are additional costs involved in implementing some parts of this Action Plan. The additional funding will need to be considered through the development of the Long Term Financial Strategy (LTFS) and the Annual Plan process.

The Regional Council cannot reverse wetland decline on its own. This chapter also describes who the Council would like to work alongside to achieve this.

### **5.1 What Resources Are Needed?**

This Action Plan builds on what the Council is already doing. Most of the funding for activities described in this plan are already allocated through the Long Term Financial Strategy.

It is anticipated that that extra funding needed to implement this Plan will be about \$70,000 per year in the period 2003/2004 to 2005/2006. This is outlined in Appendix 2.

### **5.2 Who Does Council Want to Work With?**

The Regional Council cannot reverse wetland decline on its own. As part of finalising this Action Plan staff will talk directly with the following groups to seek their feedback.

#### **5.2.1 *Landowners***

Landowner involvement is crucial to halting the decline of wetlands in the Region. We need to talk to wetland landowners to find out their level of interest and commitment to restoring wetlands on their land, before developing a programme of education and incentives. Farmers are a group of landowners who we will need to target because there are a number of wetland remnants on farm land.

#### **5.2.2 *Local Iwi***

As part of developing this Action Plan, Iwi will be asked how they would like to be involved. There is potential for more wetland projects to be funded as part of Iwi Project Funding.

#### **5.2.3 *Interested Community Groups***

A number of community groups are interested in wetlands, from environmental groups, such as local branches of Forest and Bird, to neighbourhood groups such as Residents and Ratepayers Associations. We would like to know how these groups

would like to be involved. The input of Care Groups working on wetlands will also be sort.

#### 5.2.4 *Local Territorial Authorities*

Territorial authorities will also be contacted about this Action Plan as their future involvement is important because:

- They may have significant wetlands in their areas of jurisdiction
- We have a joint responsibility with local councils to regulate the activities that impact on wetlands.

We hope to work with local territorial authorities to co-ordinate the provision of non-regulatory assistance for private landowners.

#### 5.2.5 *Wellington Fish and Game Council*

The Wellington Fish and Game Council manage a large number of wetlands and represent a large number of wetland 'users'.

#### 5.2.6 *Department of Conservation*

DOC (DoC) and the Council need to work together closely because both parties often manage different parts of the whole system. For example;

- At Lake Wairarapa, DoC manages most of the wetlands surrounding the lake and the Regional Council controls the water levels and has a role in managing the catchment use; and
- At the Pencarrow Lakes, DoC control the lakes themselves, and the Regional Council control most of the lakes catchment.

There are also opportunities for DoC and the Council to co-operate in developing a wetland monitoring programme and prioritising wetlands in the Region.

## Chapter 6: How Do We Know If We Are Achieving Our Vision?

This chapter describes the monitoring the Council will undertake to see if we are making progress towards our vision.

A number of wetland indicators are proposed:

- Change in wetland extent;
- Land use, buffers and fencing;
- Percentage of wetlands with disturbed hydrology;
- Percentage of plant and animal pests;
- Indigenous biodiversity; and
- Voluntary action and care group participation.

### 6.1 Monitoring Our Wetland Resource

We will monitor the Region's wetlands to determine if our policies and management techniques have protected and restored them. The information generated will tell us if wetlands are getting better or worse with time, and suggest the potential agents of change.

Monitoring will be tailored to:

- Track the extent of known and potential wetland threats and pressures;
- Assess the state of wetland in the presence or subsequent removal of those threats and pressures; and
- Gauge the response of society to wetland protection and restoration policies.

We have identified a number of indicators for monitoring wetland change. This chapter describes the indicators we will use to monitor change, how we will monitor those indicators, and the scale at which the information will be used.

### 6.2 Wetland Indicators

#### 6.2.1 *Change in Wetland Extent*

The extent of wetland habitat types across the Region will be monitored. This wetland state indicator will tell us if we are holding the line or if wetland habitats are continuing to decrease.

The area of known wetlands in each drainage division or catchment will be mapped in GIS at 1:5000 scale or smaller, based on known hydrological extent and/or extent of wetland vegetation. This kind of mapping will be carried out every five years and the differences in the areas mapped calculated. This will allow this information to be included in future State of the Environment Reports. However, if there is little change in wetland extent, it may be sensible to monitor at an interval greater than five years. Satellite imagery collected over 10-year intervals since 1975 provides information on historical wetland extent.

This indicator is prone to quite large errors introduced by the different people drawing the maps. However, it is reasonable to assume a difference of 10% or more in area is a significant change and is not due to observer error. To quantify the possible degree of error, a representative sample of protected and non-protected wetlands may be monitored at a local level using ground based transects to determine change in extent.

The mapping exercise takes a lot of time and resources. In the future, determination of hydrological and vegetative extent may be done digitally, using satellite imagery or aerial photography. At present, the technology to do this is not as good as mapping the areas by hand using aerial photographs and ground referencing work.

Looking at total change in wetland extent is not always useful. Since we are continually adding newly discovered wetlands the data will always give the impression of increasing overall area. Instead, changes in the extent of those wetlands mapped more than once will be used to calculate change. The magnitude of the change can then be aggregated up to catchment and regional level.

### 6.2.2 *Land Use, Buffers and Fencing*

Some land uses, such as intensive agriculture and horticulture can threaten wetlands by elevating nutrient levels entering the wetland and by diverting water away from the wetland. The potential impact of land use can be reported at a regional/catchment level and a local/wetland level. For example, we could report the number of wetlands whose surrounding land use means they are threatened by agricultural pollutants.

Wetlands benefit from having a 'buffer' area, that is, ideally the dry margins of a wetland should have their original vegetation or be planted and fenced from stock. We will monitor the number of wetlands that have an intact 'buffer' area and the number that are fenced. This information can be reported as the percentage of wetlands fenced and the percentage of 'buffered' wetlands.

For high priority wetlands we will monitor the effect of surrounding land use more closely.

### 6.2.3 *Wetlands with Disturbed Hydrology*

Drainage, flood protection schemes, and ground and surface water abstraction may be threatening the viability of existing wetlands by altering the natural hydrological regimes that once drove them.

We can classify the level of hydrological disturbance based on:

- the presence and proximity of drains;
- changed basin morphology and flooding regime;
- known drops in groundwater caused by groundwater pumping or lack of 'recharge' to the groundwater within the catchment; and
- scour of channels in the wetlands caused by impervious surfaces in the catchment.



At a local level, the hydrological regime of priority wetlands will have quite specific monitoring requirements to determine if the hydrological regime conforms with that which once existed or, at least, is following patterns of wetland evolution that will result in predominantly indigenous ecosystems. A specific monitoring programme can be developed after an initial hydrological investigation is undertaken. This initial investigation will involve recording water levels within the wetland and ground water levels to assess the fluctuations of water levels within the wetland, frequency and duration of flooding, water depth, direction of groundwater flow (e.g. into or out of the wetland etc).

#### 6.2.4 *Plant and Animal Pests*

Specific monitoring strategies will be based on the type of animal or plant pest and type of control policy. Generally we will monitor aspects of the pests themselves such as indices or direct measures of extent or density. The change in pre-control and post-control numbers can be used to determine how effective pest control has been.

For weeds in priority wetlands, the preferred approach will be to determine the full extent of every infestation and monitor the change in infestation size over time. The information can be simplified and aggregated to catchment level to determine how many wetlands of special interest are infested with each weed species.

Mapping of the extent of weed infestations through field-work may not be very practical. Aerial photography offers the ability to cover the whole wetland with minimal disturbance of the ecosystem and the potential to use digital technology to analyse infestations in the future.

Fixed photopoints will prove useful for time series analyses of particular infestations. Photopoint sites will be permanently marked and have GPS co-ordinates taken for easy relocation.

Where pest density cannot be directly monitored, as is usually the case for pest animals, estimates will be made by randomly sampling the population. For pest animals an index of the population density can be made based on the number of animals trapped over a certain period of time.

For plant and animal pests across the Region, a random survey can be made of all of the wetlands in the wetland database. The number of wetlands with pests present will be reported. This approach has already been taken by the Council's Biosecurity Department Pest Plants staff to determine the extent of Regional Pest Management Strategy weeds in wetlands.

#### 6.2.5 *Indigenous Biodiversity*

The response of the native biota will need to be monitored to determine if our attempts to protect wetland biodiversity have worked.

As we cannot monitor all species we will monitor plants and animals that are sensitive to hydrological change and/or the presence of other pressures rather than robust species that can persist and degraded sites. These indicators must also be relatively

common or easy to find. These species should show an immediate positive response, and the fate of individuals may be tracked over time.

Another set of indicator species we will use are those that are now locally rare, but which used to be common. The rate of increase in abundance of such species will be a useful measure of success. DoC's help will be sort in determining the best indigenous biodiversity indicators.

Plants are the easiest indicator to measure. Options for monitoring native plant response include fixed 20m by 20m vegetation plots, transects or photopoints. Plots allow us to quantify species and community changes over time and allow for species/area estimates to be made. Transects will also allow us to quantify species and community changes, but species/area estimates are less precise using this method. The advantage of transects are that they are easier to do and less time consuming than plots and cross many wetland ecotones. The same transects can be used to monitor both extent and vegetation. Fixed photopoints are by far the easiest measure of landscape changes and will be used as a record.

#### 6.2.6 *Voluntary Action and Care Group Participation*

The condition of wetlands will not get better without the co-operation and action of private land owners. We will monitor the percentage of priority wetlands being covenanted, and which organisations hold those covenants.

The work of volunteers participating in the recovery of public wetlands can also be measured.

#### 6.2.7 *Environmental Performance Indicators*

In addition to the monitoring strategy described, a team of wetland specialists is working on indicators for wetland monitoring as part of the Ministry for the Environment's Environmental Performance Indicators Programme. This programme is likely to influence future wetland monitoring in the Region.

## References

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## Appendix 1: Wetlands on land owned or managed by the Council

### 1. Pencarrow Lakes, East Harbour Regional Park

The lakes and wetlands at Pencarrow head are of national significance. The Department of Conservation manages the Pencarrow Lakes (Kohangapiripiri and Kohangatera) as a Wildlife Management Reserve. Hutt City Council manages the esplanade reserve around the lakes and the Wellington Regional Council manages the land surrounding the lakes and esplanade reserve (the Lakes Block). Large portions of the headwaters to the lakes and the wetlands are in private ownership.

Lake Kohangapiripiri covers an area of around 13 hectares with around 43 hectares of wetlands. Lake Kohangatera occupies an area of around 17 hectares and has around 150 hectares of associated wetlands. The wetlands and beaches support largely indigenous plant communities, some of which are regionally threatened. The lakes, wetland, beaches and surrounding area provide habitat for a range of bird and fish species, some of which are rare.

#### *What we are doing now*

The Regional Council is managing the environmental values of the Lakes Block with both the City Council and Department of Conservation (DoC). We are investigating weed control in conjunction with DoC and discussing options for long-term sustainable management of the area. DoC has recently completed an assessment of the conservation values and management of the lakes, which provides valuable information about the lakes and management recommendations for the lakes and their associated wetlands.

The Regional Council is reviewing its management plan for East Harbour Regional Park (including the Lakes Block). We have developed a concept development plan for the Lakes Block, which includes retiring stock from the area, allowing large areas of existing farmland to regenerate or actively revegetating parts, and developing walking tracks around the Block.

We are also negotiating to take over the management of the following areas:

- the Hutt City Esplanade Reserve around the lakes; and
- the Department of Conservation's small Lighthouse Reserve.

#### *What we would like to do*

- stop grazing at expiration of the grazing licence in October 2003 to enable the area to regenerate;
- actively revegetate important areas and undertake weed control; and
- protect the wetlands and riparian areas flowing into the lakes.

Like all proposals on Regional Park land, feedback will be sort as part of the Parks Management Plan review.

## 2. **Orongorongo Montane Wetland, Wainuimata/Orongongo Water Collection Area**

The Orongorongo wetland is the most pristine wetland in the Wellington Region of any significant size. This high altitude wetland is on a terrace beside the Orongorongo River, within the Wainuimata-Orongorongo Water Collection Area. It is surrounded by high quality forest. The primary species present in the wetland are manuka, swamp coprosmas and podocarps.

### *What we are doing now*

Current management of the wetland and adjacent forest includes:

- possum control (part of a 5-year 1080 control program);
- ungulate control – intensive goat, deer and pig control since January 2000;
- research - wetland vegetation, snail populations and moth species (undertaken by staff and students at Victoria University).

### *What we would like to do*

- undertake a hydrological survey to determine wetland age and wetland hydrology;
- continue to protect the wetland from introduced animals and plants; and
- continue to encourage research by Victoria University including research on the age and hydrology of the wetland frog species and more insect work.

## 3. **Ladle Bend Wetland, Pakuratahi Forest**

The Ladle Bend wetland is a bog fed by rainfall. The wetland covers an area of around 1.5 hectares. The wetland catchment is largely in pine trees although there is some native vegetation in the gullies feeding into the wetland. There is no open water.

The primary plant species is manuka, which occurs on the peat soils. In wet areas there are patches of sphagnum and sedge, with less manuka. The wetland contains 49 species of native plants. There are few exotic species in the wetland apart from some small patches of gorse, however, the perimeter of the wetland contains large areas of blackberry.

Twelve species of indigenous land snails live in the wetland's leaf litter. The wetland is regionally significant for its habitat.

### *What we are doing now*

The Regional Council did some restoration plantings in June 2000 in the logged area up hill of the wetland. We will continue to monitor and weed the plantings where necessary. We are undertaking a research project on the viability of nursery-grown seedlings versus natural re-growth.

Possums are controlled in this area as part of the Mangaroa Block Tb program. Recreational hunting occurs in the surrounding area and some contract hunting of

goats will be funded each year. The rangers also undertake pest control of possums, rabbits, hares, goats and deer in the area.

Weeds are a problem – blackberry especially, though the wetland itself is relatively weed-free. Self-seeding pine trees may also become a problem.

***What we would like to do***

- continue current pest animal and plant pest control;
- monitor restoration plantings; and
- record nutrient levels in the water to determine if there are any effects from adjacent land uses.

**4. Whakaitikei, Martins River, Valley View wetlands, Akatarawa Forest**

The three Drapers Flat wetlands are relatively small in size with little open water, dominated by raupo. The hydrology has been modified into the larger of the wetlands because the uphill areas are planted in pine trees has been built. These have changed the drainage into the wetland. The water levels are likely to have been lowered by these changes.

We have little information on the Martins River ephemeral wetland. It is a natural Kahikatea Swamp containing sedges, coprosma species and divaricating shrubs. The hydrology may also have changed causing the wetland to dry out.

There are several other small wetlands in the Akatarawa Forest:

- Valley View (ephemeral wetland planted with exotics by the Farm Forestry Association, also containing manuka and sphagnum moss);
- Hukinga; and
- Western Whakatikei (kahikatea around the fringes, toetoe, sedge species).

***What we are doing now***

Possum control has been completed in some areas (Drapers Flat and Western Whakatikei in 1996 and 2001, Martins River, Hukinga and Valley View 1997 and 2002) as part of a 5-year 1080 possum control rotation. There is recreational hunting in the Forest and a professional operation is planned for goats in 2003. Weeds in the Forest have been mapped and some control of wilding pine species is planned. Access by grazing stock has been a problem in the past, but the contract between Plantation Forestry and the farmer was allowed to lapse in 2000.

***What we would like to do***

- continue animal control and undertake more intensive plant control;
- continue to advocate for fencing of neighbouring boundaries to minimise stock intrusion;
- research vegetation types and fauna; and
- research the wetland's hydrology and take any remedial steps identified as appropriate.

## 5. **Queen Elizabeth Park Wetlands**

Queen Elizabeth Park contains large areas of peat land drained years ago for farming. The Park Management Plan provides for some of these areas to be fenced off and retired from grazing. The Council set aside money for wetland restoration in the Park, along with money for restoring a lowland forest remnant (in association with Kapiti Environment Action and Forest & Bird) and dune restoration in the Park.

### *What we are doing now*

Around 17 hectares of wetland in the southern portion of the Park has been fenced off to protect an ephemeral wetland containing a nationally rare native grass. There are two small water bodies that retain water most of the year. We have undertaken a wetland restoration design and associated hydrological study for this area of wetland. There has been some planting in the area and we are doing some pest plant and animal control, although further work is needed.

We are planning to excavate one of the small water bodies to enlarge it, then plant it with wetland species. In addition to this, we will need to do further pest plant and animal control. We are monitoring water levels in the area and may do further hydrological studies in the future.

Some of the wetland restoration will be funded by Transit to mitigate the loss of wetland as part of the State Highway 2 upgrade. The Council will also acquire some Transit land at the Northern boundary of the park that contains a wetland in the near future.

### *What we would like to do*

There are large areas of peat land still being farmed in the northern portion of the Park. Subject to the outcome of the up-coming Park Management Plan review, we would like to gradually retire further areas of former wetland and restore them. We see this as a long-term objective.

## 6. **Swampy Gully, Battle Hill Farm Forest Park**

The Council has provided money for the restoration of a wetland in Swampy Gully, Battle Hill Farm Forest Park. This area was drained many years ago for farming, however a small ephemeral wetland remains at the top of the valley. The restoration project involves creating wetland habitat and stabilising the earthflows in Swampy Gully. Three small earth dams will create ponds and associated wetlands on the main stream through the Gully, and two small earth dams will create ponds on a subsidiary branch of the stream. The project will create around 8300 square metres of wetland and t around 5.2 hectares of valley floor and hillside, as well as protecting the small ephemeral wetland.

This wetland creation and restoration project will be used to demonstrate what wetland restoration and creation can achieve, and hopefully inspire similar projects on private land. Interpretation signs on site will detail what techniques have been used. The area is accessible to the public and close to other demonstration projects:

- the fencing and planting of a wetland seep that demonstrates how seeps can remove excess nutrients from water, and
- a part of the Horokiri Stream that has been retired from grazing and planted in native species.

***What we are doing now***

We have completed planning, hydrological studies, design work and obtained resource consents for the work. Wetland construction and fencing will take place during 2002. Planting of the wetland and adjacent hillside will follow over the next few years. We will also be undertaking pest plant and animal control.

**7. Sledge Gully Wetland, Wainuiomata Recreation Area**

There is a very small wetland in the Wainuiomata Recreation Area near the Sledge Track. It contains sedges and flax species, along with a range of introduced grasses and other plants.

***What we are doing now***

We are planning to plant additional flax and other species in the area in association with Iwi and school groups. There are no plans to do further research or work on this wetland.

**8. Otaki River Mouth**

Funds have been set aside for this financial year for work on a lagoon beside the Otaki River Mouth. The key issues are managing public access (particularly the use of vehicles in this sensitive environment), weed invasion, and the restoration of plants and animal communities that would have normally occurred in the area.



## Appendix 2: Wetland Action Plan Funding Requirements

| TABLE 1: Wetland Recovery Programme Funding Requirements (additional Funding Requirements in Bold)*              |  |                    |                                     |   |   |   |
|--|--|--------------------|-------------------------------------|---|---|---|
| Description  | Funded Department  | ½                  | 02/03                               | ¾   | 04/05   | 05/06   |
| Battle Hill Wetland Restoration (demonstration project)  | Regional Parks – Landcare Division                           | \$10,000           | \$35,000                            | \$10,000  | \$10,000  | \$5,000   |
| Queen Elizabeth Park wetland   | Regional Parks – Landcare Division                           | \$17,000           | \$13,707                            | \$41,000  | \$17,000  | \$15,000  |
| Orongorongo Montane Wetland  | Regional Parks – Landcare Division                           | \$4,600 (research) |                                     | <b>\$6,000 (research wetland hydrology)</b>               | <b>\$3,000 (research)</b>                                 | <b>\$3,000 (research)</b>                         |
| Pakuratahi Ladle Bend Wetlands   | Regional Parks – Landcare Division                           | \$4,500            |                                     | <b>\$3,000 (weed control and research)</b>                | <b>\$2,000 (weed control)</b>                             | <b>\$2,000 (weed control)</b>                     |
| Akatarawa Forest Wetlands  | Regional Parks – Landcare Division                           |                    |                                     |   |   | <b>\$6,000 (investigation into Martins River)</b> |
| East Harbour Regional Park Development (not all of the budget is to be spent directly on the Lakes and Wetlands) | Regional Parks – Landcare Division                           |                    |                                     | \$79,000  | \$79,000  | \$79,000  |
| Lake Wairarapa Region Parks  | Regional Parks – Landcare Division                           |                    |                                     |   |   | \$300,000   |
| Lake Wairarapa   | Wairarapa Operations   |                    |                                     | <b>\$10,000 (development of wetland management plans)</b> | <b>\$20,000 (development of wetland management plans)</b> |   |
| Wetland Advisory Service   | Resource Policy (Environment Division); Wairarapa Operations | \$10,000           | \$50,000 (development of resources) | \$50,000 (grants and subsidies)                           | \$50,000 (grants and subsidies)                           | \$50,000 (grants and subsidies)                   |
| <b>Wetland Hydrology (investigation of one significant at risk wetland per year)</b>                             | Resource Investigations, Environment Division                |                    |                                     | <b>\$20,000 (Taupo Swamp, Plimmerton)</b>                 | <b>\$15,000 (Pritchards Swamp, Otaki)</b>                 | <b>\$15,000 (Wainawa Swamp, Masterton).</b>       |
| Wetland Database Project   | Biosecurity, Wairarapa Division                              | \$8,000            | \$10,000                            | <b>\$5,000 (wetland monitoring)</b>                       | <b>\$5,000 (wetland monitoring)</b>                       | <b>\$5,000 (wetland monitoring)</b>               |
| Wetland KNE programme (Lake Pounui and Te Harakeke)  | Biosecurity, Wairarapa Division.                             | \$29,000           | \$30,000                            | \$8,000 (maintenance of existing KNE's)                   | \$4,000 (maintenance of existing KNE's)                   |   |
| <b>Wetland KNE Programme (new KNE sites, to be identified as part of database project)</b>                       | <b>Biosecurity, Wairarapa Division.</b>                      |                    |                                     | <b>\$30,000 (to add one new KNE site)</b>                 | <b>\$25,000 (to add one new KNE site)</b>                 | <b>\$25,000 (to add one new KNE site)</b>         |
| <b>Additional Funding*</b>   |  |                    |                                     | <b>\$82,00</b>  | <b>\$74,000</b>   | <b>\$54,000</b>                                   |

\* subject to consideration through the Long-term Financial Strategy