Hydroelectricity or wild rivers? Climate change versus natural heritage

May 2012



Parliamentary Commissioner for the **Environment** Te Kaitiaki Taiao a Te Whare Pāremata

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Commissioner's overview

It is 34 years since I arrived in Berkeley to study for a degree in Energy and Resources at the University of California. Energy was a hot topic – there had been one oil price shock in 1973 and another was to come in 1979. Discussion of the 'energy crisis' was often framed in the language of (good) renewable energy and (bad) non-renewable energy. A fellow student asked me how we generated electricity in New Zealand, and I proudly replied that most of it came from renewable hydroelectricity.

His response caught me by surprise. He said hydroelectricity is one of the most environmentally destructive forms of energy. Today I would not let him get away with such a general statement. With the environment, like all else in life, things are seldom black and white. But nevertheless he put his finger on an important issue.

We tend to think of fraught environmental issues as *environment* versus *economy*. But sometimes the conflict is *environment* versus *environment*. Building a hydroelectric scheme on a wild and scenic river is one. Hydroelectricity is good for the environment because it is a way of generating electricity without emitting the greenhouse gas carbon dioxide. Wild and scenic rivers are good for the environment too – they are a precious part of our environmental heritage, and New Zealanders love their rivers.

I began to think about this conflict when letters started coming into the office about the proposed hydroelectric dam on the Mokihinui River on the West Coast of the South Island. It seemed to me that there were strong arguments both ways and that this is a genuine dilemma. As this report was going to the printers the developer, Meridian Energy, announced that the scheme was not going ahead.

This report is not an evaluation of the merits of the now defunct Mokihinui proposal, although this case is used to illustrate some of the flaws in the system. Rather, the report is about the system of legislation, institutions, and processes under which choices are made between hydroelectricity and the protection of wild and scenic rivers.

A hydroelectric scheme cannot be built without securing resource consents under the Resource Management Act. Under that process, renewable energy proposals are explicitly favoured. This is to help meet the Government's goal of 90 percent of the country's electricity coming from renewable sources by 2025. But it also has the effect of tilting decisions in favour of hydroelectricity and away from the protection of wild and scenic rivers.

The 'Think Big' era was a tumultuous time for energy in New Zealand. The proposal by the New Zealand Electricity Department to build the high dam on the Clutha River at Clyde led to a Bill that split Parliament, and was passed by a single vote. It was, however, one factor that led to the introduction of a Wild and Scenic Rivers Bill, modelled on legislation in the United States. The Bill proposed that wild and scenic rivers be protected by water conservation orders and was passed into law as an amendment to the Water and Soil Conservation Act in 1981.

Ten years later water conservation orders were incorporated into the Resource Management Act. But in the two decades since, there have been only four applications for water conservation orders under that Act and only two have been successful. Another issue is that the applicant for most water conservation orders has been Fish and Game New Zealand, and understandably this organisation is focused on the protection of rivers that are good trout and salmon fisheries. Fish and Game's efforts have protected many rivers, but the value of wild and scenic rivers has many dimensions and is far greater than the sports fish they contain. Some changes are clearly required if water conservation orders are to serve Parliament's intended purpose. A strategic approach is needed to protect our wild and scenic rivers.

Many wild and scenic rivers flow through the conservation estate. However about one third of conservation land has never been systematically assessed and classified. This 'stewardship land' makes up nearly 10 percent of New Zealand's land area. It is widely assumed that stewardship land is of low conservation value. Yet the land through which the Mokihinui River flows has been left as stewardship land, and the Department of Conservation was appealing against the granting of the resource consents for the proposed hydroelectric dam, so clearly sees the land as valuable. Some consistency is sorely needed. I expect to look at this vexed issue of stewardship land in more depth in my report on commercial use of the conservation estate.

As I was writing this overview, Contact Energy announced that it did not intend to build more dams on the no longer wild but still scenic Clutha River. It looks likely now that most new renewable electricity will not come from rivers, but from geothermal steam and wind, but this may change in the future.

However, the general problem of environment versus environment will continue in many guises. For instance, an easy way of taking some of the greenhouse gas carbon dioxide out of the atmosphere would be to let wilding pines spread over the South Island high country. Reducing the amount of carbon dioxide in the atmosphere is good for the environment, but so is controlling the spread of wilding pines. One environmental gain can come at the expense of another. I hope this report is helpful for thinking about such conflicts.

Where such conflicts exist between hydroelectricity and wild and scenic rivers - climate change versus natural heritage - I have concluded that we need to pay more attention to the protection of the rivers.

On my desk is a battered copy of a book written in 1960 by Professor John Salmon titled *Heritage destroyed: The crisis in scenery preservation in New Zealand.* In it he tells the story of the inundation by a hydro lake of most of Geyserland – the spectacular Orakei Korako thermal area – which contained the second largest geyser in the world. According to Salmon, *"a 20 ft lower level in Ohakuri Lake would have saved all of Orakei Korako for posterity"*.

I like to think that today we do better, but we can do better still.

y.c. Wifes

Dr Jan Wright
Parliamentary Commissioner for the Environment



Introduction

A river is more than an amenity—it is a treasure that offers a necessity of life that must be rationed among those who have the power over it. Oliver Wendell Holmes, U.S. Supreme Court Justice, speaking about the Delaware River in 1931

Turbulent white water rapids and the counterpoint of quiet deep pools untouched, framed by native bush and rich in life - epitomise the wild and scenic rivers which feature in marketing campaigns, movies, and calendars. But these rivers are much more than the images we use to sell our country abroad; for many of us they are a fundamental of our identity as New Zealanders. These rivers carry with them an emotional resonance which places them in conflict with modern day practicalities. They are a treasure as well as an asset.

Rivers in their natural state are increasingly scarce in New Zealand. And indeed less than 1% of the world's rivers remain in their natural state.¹

Undamaged river ecosystems are crucial for many threatened native species, including whio (blue duck), and longfin eels (tuna). Wild and scenic rivers are also valued by many for their beauty and landscape, the opportunities they provide for recreation like walking and kayaking, and the important part they have played in the development of New Zealand's history and culture.

Hydroelectricity, on the other hand, helps deal with the most important environmental issue facing the planet – climate change. Along with wind and geothermal power, hydroelectricity is a low carbon way of generating electricity. More generation from renewable sources should mean fewer greenhouse gas emissions, helping New Zealand meet its climate change obligations. And for many there is the added beauty of churning water and the ingenuity of our engineers. But hydroelectricity schemes usually require the significant modification of rivers. When this occurs on free-flowing rivers the effect can be particularly severe. A hydroelectric development, especially if it involves a dam, can destroy the wild and scenic features of a river. The system that decides whether or not a hydroelectricity development should proceed on a wild and scenic river must weigh the environmental benefits of both very carefully.

1.1 The purpose of this report

The Parliamentary Commissioner for the Environment is an independent Officer of Parliament, with functions and powers granted through the Environment Act 1986. Her role allows a unique opportunity to provide Members of Parliament with independent advice in their consideration of matters that may impact on the environment.

This investigation began after the Commissioner received a number of letters from members of the public concerned about Meridian Energy's now defunct proposal to build a dam on the Mokihinui River on the West Coast of the South Island. However, the Mokihinui case provides a useful insight into some of the problems in the way choices between hydroelectricity and wild and scenic rivers are made. Consequently, it is used to illustrate certain issues discussed in the report.

This report has been produced pursuant to subsections 16(1)(a) to (c) of the Environment Act 1986. It is an assessment of the system - policy, legislation, institutions and processes - within which decisions are made about whether or not to allow hydroelectricity developments on wild and scenic rivers. The focus is on whether the system appropriately takes account of the different environmental values of hydroelectricity and wild rivers.

Box 1.1: How electricity is generated from water

Hydroelectric power plants use falling or flowing water to turn turbines that generate electricity. Different types of hydro developments use the power of the water in different ways.

Conventional dams interrupt the flow of the river and create a reservoir. Water flows through pipes (penstocks) to the power station below the dam where it turns turbines before being discharged down river. The reservoirs store water for times of low rainfall.

Run-of-river dams rely on the continual flow of the river to maintain the water pressure that powers the turbines. They have little or no storage capacity.

Water diversion schemes divert some of the flow of a river into a channel or tunnel where it turns turbines before being returned to the river downstream. Sometimes the natural height difference between two different water bodies is used, as at Manapouri.

1.2 Structure of report

The remainder of this report is structured as follows:

Chapter 2 is a brief history of hydroelectricity in New Zealand, describing the three broad stages of the development of hydroelectric power schemes.

Chapter 3 looks at the concept of a wild and scenic river and the history of how these rivers have been protected in New Zealand.

Chapter 4 describes the two main ways through which wild and scenic rivers are and can be protected today.

Chapter 5 outlines how the Resource Management Act and the Conservation Act guide decisions about whether or not hydroelectric schemes should be built on wild and scenic rivers.

Chapter 6 describes the environmental issues involved and provides some guidance about how to compare these two very different environmental 'goods'.

Chapter 7 analyses the system that governs whether or not a hydroelectric scheme can be built on a wild and scenic river, and identifies a number of problems.

Chapter 8 contains five recommendations aimed at improving the system within which choices between hydroelectric schemes and wild and scenic rivers are made.

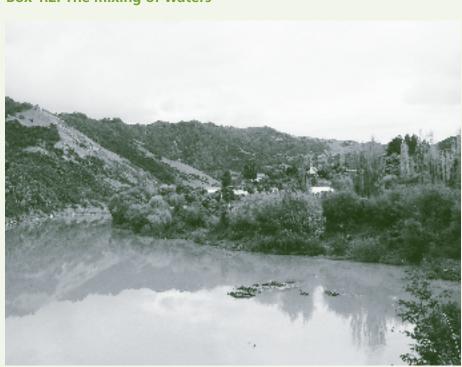
1.3 What this report does not cover

This report is about how decisions are made when balancing the competing demands for protecting and preserving wild and scenic rivers, and promoting low carbon electricity generation.

The report does not make the case for the protection of any particular rivers, nor the promotion of any specific hydroelectricity project. Rather the report serves to question the systems and processes currently in place and suggest improvements for the future. Further, this report also does not cover:

- Proposals for irrigation schemes and other developments on wild and scenic rivers, although many of the conclusions will be relevant
- Any detailed assessment of the environmental effects of a hydroelectricity scheme on a river
- Assessments of specific proposals, although the hydroelectric scheme that was proposed for the Mokihinui River is used to illustrate particular issues.

Box 1.2: The mixing of waters



Source: GNS Science

"Water, whether it comes in the form of rain, snow, the mists that fall upon the ground and leave the dew, or the spring that bursts from the earth, comes from the longing and loss in the separation of Rangi-o-te-ra and Papatuanuku in the primal myth. The tears that fall from the sky are the nourishment of the land itself. The life-giving water is founded upon a deep quality of sentiment that, to Maori, puts it beyond the realm of a mere useable commodity and places it on a spiritual plane." - The Whanganui River Report (WAI 167)

The Whanganui River

The Tongariro hydro scheme (1978) takes water from headwaters around Mt Ruapehu for a 240MW Tokaanu power station near Turangi. The scheme diverts water from the Whanganui catchment into Lake Taupo and the Waikato catchment.

For Ngati Rangi and Whanganui iwi the mixing of their waters with those of other iwi damages the wairua (spirituality) of the people. In 2004 Ngati Rangi appealed Genesis Energy's 35 year consents for the power scheme and the Environment Court reduced them to 10 years. The Court recognised that the diversions have considerable effect on cultural and spiritual values. The case almost went as far as the Supreme Court before the parties reached an agreement in 2011 and the 35 year consents were upheld.

Source: Ngati Rangi Trust v Manawatu-Wanganui Regional Council (ENC, 03/06/11)



Harnessing the power of water hydroelectricity in New Zealand

With its mountainous geography and many rivers, hydropower has long been an abundant, cheap, and reliable way of generating electricity in New Zealand. Beginning with the tiny power plants of the 1880s to the giants of Manapouri, Benmore, and Clyde today, hydroelectricity has underpinned much of the country's development.

Most countries do not have the hydroelectricity opportunities that New Zealand possesses. Hydropower has largely enabled New Zealand to have one of the lowest greenhouse gas electricity systems in the world, while other countries burn coal and gas to produce most of their electricity.

But the history of hydroelectric development in New Zealand is also a story of mounting controversy. Over the twentieth century as hydroelectricity developments grew in numbers and size, so did concern about their impacts on the natural environment. A proposal to raise and merge Lake Manapouri and Lake Te Anau in the 1960s attracted so much opposition that it is often described as the genesis of the modern New Zealand conservation movement.²

While the building of hydroelectricity projects slowed towards the end of the twentieth century, concern about climate change has seen renewed interest in renewable energy generation.

The building of hydroelectric power schemes in New Zealand can be divided into three broad stages. These three stages are briefly described below.

1. Early hydroelectricity schemes

The first small local schemes began towards the end of the nineteenth century. The construction of larger dams began in the 1920s, predominantly on the Waikato River, but had relatively low generating capacity compared with later schemes of similar size. The 1930s saw a national electricity network begin to develop. This early period finished about the end of the Second World War.

2. The big dam era

The latter half of the twentieth century, particularly the 1950s and 1960s, saw the systematic construction of large dams. Towards the end of the century, as the easy options diminished, new hydroelectricity schemes were often smaller and in more remote locations. Through this period public concerns about the environmental impact of dams started to emerge. The last really big dam, the Clyde, was completed in 1993.

3. Hydroelectricity in the twenty-first century

The twenty-first century has seen a new drive for more renewable electricity encouraged by central government policy, particularly the goal of 90 percent of the country's electricity to come from renewable sources by 2025. While it currently appears that most new power plants will be run on geothermal energy and wind, there are still many opportunities for hydroelectric schemes.

This chapter necessarily focuses on some of the more controversial hydroelectricity developments, though it must be noted that many large schemes, often those on already modified landscapes and rivers, attracted little opposition.

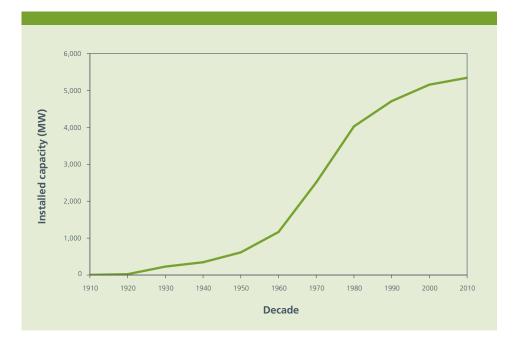


Figure 2.1 Installed hydroelectric capacity over the last century. The s-shaped curve shows the rapid growth from the 1950s to 1970s.

2.1 Early hydroelectricity

The earliest power plants in New Zealand ran on gas. One was installed in the basement of Parliament in 1883 to light 300 lamps, although "*Members grumbled about loud bangs from the engine and fluctuations in the brightness of the light*".³

The first hydroelectricity generator was built in 1886 using water from Skippers Creek in Central Otago. It was used to drive stampers to crush quartz in order to extract the gold.⁴

Two years later, the town of Reefton diverted water from the Inangahua River along a tunnel to generate power for street lights. The first public showing of this wondrous new source of light involved displaying an outside arc lamp over the hills. The local newspaper reported "*it was light as day, but the perspective was terribly confusing, and many people got into difficulties through trying to climb over the shadows of fences...*"⁵

The Reefton power plant was tiny by modern standards, with a capacity of less than one megawatt (MW).⁶ Over time, as technology improved, hydroelectric schemes became increasingly larger and more sophisticated.



Source: Muir Moodie, Postcard 1904

Figure 2.1 The town of Reefton on the West Coast was the first town in New Zealand to have its street lights powered by hydroelectricity. The power house and the water diversion to the Inangahua River are in the foreground. Early dams were popularly viewed as a favourable improvement on nature. Some opposition did exist however, with the effect on 'scenery' as the major concern. One notable case was the raising of Lake Monowai in Fiordland. While opposition to raising Lake Monowai was muted, it became a reference point for the Manapouri campaign 40 years later.⁷

By the Second World War, New Zealand's largest power station was the Arapuni (then 103MW) on the mighty Waikato River. Although Arapuni was much larger than the earlier schemes, New Zealand's total installed hydroelectric capacity at the end of this early period was only about a fifth of what it is today. The large dams built in the latter half of the twentieth century were to dwarf all previous developments.



Source: Martin Sliva, www.newzealandphoto.info

Figure 2.2 The flooded margins of Lake Monowai today. The Monowai power station constructed in the 1920s raised the level of the lake by 2.5 metres. Even today the dead trees on the lake edge remain.

2.2 The big dam era - growing opposition

The great expansion of hydroelectricity in New Zealand took place during the second half of the twentieth century, especially during the 1950s and 1960s (see Table 2.3).

The Karapiro Dam on the Waikato was the first of the post-war hydro projects, built by the government in response to continuing electricity shortages. As blackouts became less of a concern, the building programme continued in order to provide a secure supply of electricity to encourage new manufacturing industries and to create employment. Hydroelectricity continued to expand, both in scale and generational capacity.

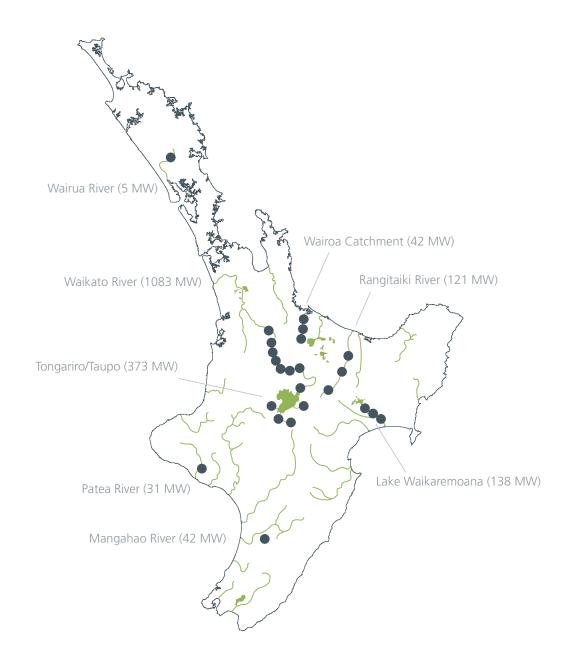
Rivers	Dam	Construction date
The Waikato	Maraetai	1953
	Whakamaru	1956
	Waipapa	1961
	Ohakuri	1962
	Aratiatia	1962
The Waitaki	Tekapo A	1951
	Benmore	1965
	Aviemore	1968
The Clutha	Roxburgh	1956
The Rangitikei	Matahina	1967

Table 2.3 Large hydroelectric dams completed in the 1950s and 1960s. Note most development was on four major rivers, with two of these rivers having more than one dam.

From about 1970, most of the big new power stations were thermal, running on natural gas from the Maui field and coal from the Waikato. The last big hydroelectricity scheme to be built was the Clyde Dam completed in 1993.

During the latter half of the twentieth century, several hydroelectric schemes were opposed because of their impacts on very different environments. These included the Ohakuri Dam on the Waikato River, the Manapouri scheme in Fiordland, and the Clyde Dam on the Clutha River, and are described below.

Figure 2.4 and 2.5 show installed hydroelectricity generation in the North Island and South Island. Most of the generating capacity is built on the Waikato and Waitaki rivers.



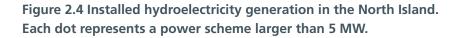




Figure 2.5 Installed hydroelectricity generation in the South Island. Each dot represents a power scheme larger than 5 MW.

Ohakuri Dam - Waikato

When the Ohakuri Dam was built on the Waikato River in 1961 it drowned about two-thirds of the spectacular Orakei Korako geothermal area, then known in tourist brochures as Geyserland. In total about 70 geysers and 200 hot springs were lost.

The losses included the world's second largest geyser. The Minginui was known to rise to 90 metres, almost twice the height of Old Faithful in Yellowstone National Park. Several silica terraces were also lost. These included much of the Emerald Terrace, which was one of New Zealand's largest following the destruction of the Pink and White Terraces in the Tarawera eruption.

Yet opposition to the inundation of Orakei Korako was muted. The lack of road access to, and knowledge of, Orakei Korako meant the merits of the project were never properly debated. At a tourism conference in 1959, the Electricity Department assured those attending that only "*a few dirty pools and gurgling geysers*" would be lost.⁸

At the time ecologist John Salmon wrote: "A 20 ft lower level in Ohakuri Lake would have saved practically all of Orakei Korako for posterity".⁹ He referred to such schemes as state-sponsored vandalism. But with the Orakei Korako battle lost, Salmon called attention to an emerging controversy – the proposed Manapouri power scheme in Fiordland National Park.

Even though many of the geothermal features of the area were drowned, Orakei Korako remains the largest geyser field in New Zealand.



Source: Orakei Korako (The Place of Adorning), Wilson J. (1945)

Figure 2.6 "Mimi Homai o te Rangi!" - The Great Geyser at Orakei Korako and Waikato River which was drowned when the Ohakuri dam was built.

Lake Manapouri - Fiordland

The Lake Manapouri power scheme was proposed in the 1950s in a bid to secure the building of an electricity-hungry aluminium smelter in New Zealand. Part of the scheme involved water flowing through tunnels from Lake Manapouri down to Doubtful Sound. But to make the scheme even bigger, a dam was proposed on the lake's outlet – the Waiau River.

The planned dam would have raised the level of Lake Manapouri by 11 metres, merging it with Lake Te Anau. Those opposed to the scheme argued it would have drowned islands, beaches, and tens of thousands of hectares of beech forest – and, as with Lake Monowai, dead trees would be left sticking out of the water for decades.

Public opposition to the proposal was huge. A quarter of a million New Zealanders signed a petition against the Manapouri hydro scheme in 1970. A particular rallying point for the 'Save Manapouri' campaign was that the Minister of Works could sign off the project in a national park without any public input.

In 1972 the high dam was abandoned. Instead, a smaller underground water diversion scheme went ahead, with control gates at both the lake's inlet and outlet.¹⁰



Source: Dominion Post Collection 1970 - Alexander Turnbull Library, Wellington, N.Z.

Figure 2.7 The Minister of Justice, Mr Daniel Johnston Riddiford, the president of the Royal Forest and Bird Society, Mr Royal Cullen Nelson, and the society's secretary, Mr D McCurdy. Shown in the foreground are bundles of signed 'Save Manapouri' petition forms.

Clyde Dam - Otago

By the late 1960s many of the less challenging hydro schemes had been built, and attention shifted to more complex power schemes. The proposal to build the Clyde Dam on the Clutha River in Central Otago was particularly controversial.

Two dam sites were under serious consideration. One option was a high dam that would inundate most of the historic town of Cromwell, the scenic Cromwell Gorge, and the surrounding orchards famous for their apricots. A second option was a low dam that would have spared 86 hectares of orchards in the gorge.¹¹

Despite successive reviews recommending construction of a low dam, the government proceeded with construction of a high dam. When the High Court subsequently ruled that the water rights for the high dam were "*unfairly allocated*", the Government passed special enabling legislation to allow construction to proceed.¹²

The Clyde dam began generating in 1993. The controversy led to active steps for the protection of New Zealand's remaining free-flowing rivers and stretches of rivers with outstanding wild or scenic value. The Kawarau Water Conservation Order, which protects much of the catchment upstream of the Clyde Dam reservoir (Lake Dunstan), resulted from legislation prompted by submissions on this dam,¹³ and by Ministerial support for a wild river protection policy.¹⁴



Source: A P Godber Collection, 1926. Alexander Turnbull Library, Wellington, N.Z.

Figure 2.8 The town of Cromwell at the confluence of the Kawarau and the Clutha in 1926. The bridge shown is still intact under Lake Dunstan.

2.3 Hydroelectricity in the twenty-first century

Since 2000 only eight new hydro power plants have been built in New Zealand; all are very small (a total installed capacity of about 17MW). Hydroelectricity expansion during this period has mainly been through improvements to existing stations.¹⁵

The only proposal for a significant hydroelectric scheme in the early 2000s, Project Aqua (520MW) on the Waitaki River, was abandoned in 2004.¹⁶

Growth in new hydroelectricity development slowed for a number of reasons. Many of the easily accessible sites for large dams had been taken, there was increasing concern about the environmental impact of large hydro schemes, and the economic reforms of the 1980s meant that large developments needed to be economically viable.¹⁷

However, concern about climate change has led to a push for more renewable electricity generation – using the power of running water, wind, geothermal steam, and tidal flows. The carbon dioxide that is emitted from burning gas and coal in thermal power plants is about 10 percent of New Zealand's greenhouse gas emissions.



Source: Parliamentary Commissioner for the Environment archives

Figure 2.9 Turbines turn at a small hydroelectric power station.

In 2007 the then Government set a target for 90 percent of electricity to come from renewable sources by 2025.¹⁸ This target remains a goal of the current Government.¹⁹ The proportion of renewable electricity grew from 66 percent in 2007 to 74 percent in 2010, driven primarily by new wind and geothermal generation.²⁰

The new target has also helped stimulate renewed interest in hydroelectricity – especially medium-sized and small hydroelectricity developments. Recent examples include a water diversion scheme on the Wairau River (72MW) in Marlborough, a new scheme on the north bank of the Waitaki (260MW), and a small scheme involving a weir and diversion on the Kaituna River (14MW) in the Bay of Plenty.

Many other potential sites for new hydroelectric schemes have been identified, ²¹ though recently plans for big dams on the Clutha and the Mokihinui have been abandoned.²²

The Mokihinui Hydro Proposal - West Coast

A proposal for a big dam on the Mokihinui (100MW) on the South Island's West Coast was recently abandoned. It was one of the largest dam proposals since the Clyde.

Meridian Energy, a state-owned company, applied for resource consents for this dam in 2007. Meridian argued the dam would improve security of supply on the West Coast and the Upper South Island, as well as helping New Zealand meet its target of 90 percent renewable generation.

A number of conservation and recreation groups opposed the dam because it would inundate the Mokihinui gorge, flooding over 300 hectares of public conservation land. White-water recreational opportunities in the gorge would be lost. The river is free-flowing from its source to the sea.

Resource consents for the dam were granted in 2010. The proposal was appealed to the Environment Court, but in May 2012 Meridian announced they would not proceed with the project citing uncertainty in getting permission to use conservation land.

Hydroelectric power stations are by their very nature tangible and concrete. In contrast, wild and scenic rivers are far more difficult to define. The next chapter explores the concept of wild and scenic rivers.



Wild and scenic rivers - a short history

Wild and scenic rivers are valued both as part of our natural environment and cultural heritage. They are sources of clean fresh water, bird, and aquatic life, and provide wild waters and river environments for people to enjoy. Many of these rivers also play a special part in New Zealand's heritage. The stories of many iwi and hapu as well as European pioneers relate to these wild rivers.

For Maori in particular, many of these rivers tie in closely with their identity.

"Water has mauri, essential sanctity, both as wai māori and as wai tai. Water must be kept in its natural state as far as it is possible to do so."

-James Ritchie, Te Ika Whenua Rivers Report (1998)

Today these rivers provide opportunities for fishing, swimming, kayaking, and rafting, and many walking tracks follow rivers. In a world increasingly losing wilderness, wild and scenic rivers are an important part of the clean green country tourists come here to experience.

For all their importance there is no precise definition of a 'wild and scenic' river. Yet, history can give us insight into how the concept of wild and scenic rivers has been regarded in the past and provide useful direction for the future. This chapter explores how wild and scenic rivers have been protected over time.

3.1 Rivers were first protected in National Parks

New Zealand's first national park, Tongariro, was established in 1887. It protected the high headwaters of the central plateau. The next was Egmont in 1900, which protected the upper reaches of Taranaki's rivers, and then Arthur's Pass in 1929, which protected the upper Waimakariri.

There are now 14 national parks protecting many larger wild and scenic rivers, like the Waiatoto River in Mt Aspiring National Park or the Heaphy River in Kahurangi. All parks now have the protection of the National Parks Act 1980 which states their purpose as "preserving in perpetuity as national parks, for their intrinsic worth and for the benefit, use, and enjoyment of the public, areas on New Zealand that contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique, or scientifically important that their preservation is in the national interest."

While the water itself is not specifically protected,²³ the land and rivers are given protection by being in a national park.²⁴



Source: Parliamentary Commissioner for the Environment archives

Figure 3.1 The Forgotten River in Mt Aspiring National Park.

3.2 Legislation to protect wild and scenic rivers

It was the 'Save Manapouri' campaign during the 1970s that led to growing concern that the right of New Zealanders to enjoy free-flowing wild rivers and scenic lakes was being forfeited. In response to such concerns, successive governments began to develop policy and legislation to protect wild and scenic rivers and lakes.

In 1978 the predecessor to the Parliamentary Commissioner for the Environment – the Commission for the Environment – released a discussion paper on the protection of wild and scenic rivers.²⁵ In its review of submissions on the paper, the Commission concluded that there was "a need for a positive policy ensuring protection of rivers or sections of rivers that have outstanding wild, scenic or other natural characteristics in their natural state".²⁶

The initial proposal was for legislation, similar to the United States' Wild and Scenic Rivers Act 1968. This law allows Congress or the Secretary of the Interior to designate a river as of wild, scenic, and recreational value, which *"shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations"*.²⁷ Today there are just over 200 rivers in the United States protected in this way.²⁸

New Zealand's own Wild and Scenic Rivers Bill²⁹ passed into law as an amendment to the Water and Soil Conservation Act in 1981 and enabled the creation of national and local water conservation orders.³⁰

3.3 Developing a national inventory

Efforts began between 1982 and 1984 to develop a national inventory of wild and scenic rivers through a submissions process.³¹

In 1985–86 Cabinet enlisted a group of experts to draw up a list of representative water bodies according to certain values that should be protected by law. This schedule was not to include rivers in national parks, which already enjoyed protection by virtue of the surrounding land. It was intended to protect important rivers until water conservation orders were applied for them. Water bodies were classified for important wild, scenic, recreational, fisheries, wildlife, flora, scientific, educational, and cultural values.

'Wild' was described as follows:

A wild river was either "extensive and remote with land and waterscapes shaped by natural processes" or "untravelled and unrestrained, but not necessarily natural or remote. A river may bubble along wildly but be in a modified area of easy access".

'Scenic' was attributed to rivers that make an essential contribution to a scenic landscape.

Its scenic value may come from "a dynamic display of natural forces (cascades, violent rapids), or from a combination of elements creating a tranquil scene with innate beauty".³²

A total of 32 rivers were identified that were classed as both 'wild' and 'scenic'. These were strongly recommended for protection. Many more rivers were determined worthy of protection for other values. No schedule of protected waters was however passed into law.³³ Out of the 32 rivers identified as both wild and scenic, 20 are today protected or partially protected – either through a water conservation order, or because they now flow through national parks. Table 3.1 lists the wild and scenic rivers identified in 1986 that still lack significant protection.³⁴

River	Region
Waipakihi	Taupo
Whirinaki	Bay of Plenty
Kaituna	Bay of Plenty
Raukokore	Bay of Plenty
Ngaruroro	Hawke's Bay
Hutt Gorge³⁵	Wellington
Clarence	Canterbury
Upper Hurunui	Canterbury
Lower Hurunui	Canterbury
Mokihinui	West Coast
Upper Hokitika	West Coast
Mararoa	Southland

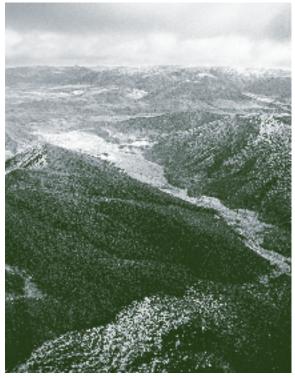
Table 3.1: Rivers (or stretches of rivers) that were identified as 'wild' and'scenic' in the 1986 schedule but still have no significant protection.³⁶

3.4 Water bodies of national importance

In 2004, at the request of the Government, a number of departments led by the Ministry for the Environment established the Water Bodies of National Importance programme.³⁷ This was not limited to rivers.

Several lists were prepared – water bodies were assessed separately for biodiversity, geodiversity, recreation, irrigation, energy, and tourism. A 'wild and scenic' classification itself was not used. Therefore, although the resulting lists would have covered many wild and scenic rivers, it is difficult to identify which rivers deserve protection specifically because of their wild and scenic qualities. It may be that the information gathered under this programme could be used to inform future policy making. The programme ceased in 2008.³⁸

There has been little progress in recent times on determining which rivers should be identified as wild and scenic rivers, and therefore afforded some form of protection. Rather, an *ad hoc* approach has developed with protections through water conservation orders being granted on at least some of these rivers.



Source: Rob Suisted

Figure 3.1 The Ngaruroro in the Hawkes Bay lacks significant protection. Fish and Game have recently announced their intention to lodge a water conservation order application for the river.

There is no precise definition of a 'wild and scenic' river. In New Zealand it usually refers to a relatively untouched free-flowing river surrounded by bush or tussock. Some rivers like the remote densely bushed Motu which flows out into the Bay of Plenty are without a doubt wild and scenic. Yet the term should not excludefree-flowing rivers in partially modified environments like the Clarence in Marlborough.



How wild and scenic rivers are protected

This chapter examines how wild and scenic rivers are, and can be, protected. There are two main ways. Some rivers are protected under water conservation orders and others are protected by virtue of flowing through conservation land.

Water conservation orders were developed to protect rivers that did not flow through national parks. National parks form the core of the modern conservation estate, and comprise about one third of conservation land. The protection of rivers that flow through the conservation estate varies.

4.1 Protecting rivers using water conservation orders

The main way to protect a river or lake with outstanding wild, scenic, ecological, recreational, cultural, spiritual, and/or scientific value is a water conservation order.

An order may protect the quantity and quality of the water itself, or aspects of the water body as a whole such as habitat or scenic characteristics. There are currently 13 water conservation orders on New Zealand rivers and stretches of rivers, and two on lakes.³⁹

Among other things, a water conservation order can set clear restrictions on hydroelectric development. To varying degrees, the provisions prohibit building dams and taking large amounts of water from a river.

Development of water conservation orders

Between 1982 and 1990, eleven national water conservation orders on rivers were applied for under the Water and Soil Conservation Act and eventually awarded. Most early water conservation orders were short and relatively straightforward, simply prohibiting activities. The first national order was put on the Motu River in 1984⁴⁰ and contained just three short sections titled "River to be preserved", "Right to dam not to be granted", and "Water rights". Over time water conservation orders became increasingly complex, incorporating water quality and flow rates on different parts of rivers.⁴¹

In 1991 the Water and Soil Conservation Act was superseded by the Resource Management Act (RMA), and since then the legislation governing water conservation orders is found in Part 9 of the RMA.⁴² Under the RMA there have been only four applications for water conservation orders, and just two – one on the braided Rangitata River in Canterbury and the other on the Oreti River in Southland – have been approved (see Table 4.1).⁴³



Source: Rob Suisted

Figure 4.1 The Motu in the Bay of Plenty was the first river to be protected by a water conservation order.

River	Applicant ⁴⁴	Applied	Granted				
National water conservation orders under the Water and Soil Conservation Act							
Motu	QEII National Trust	1982	1984				
Rakaia	Fish & Game	1983	1988				
Ahuriri	Minister of Internal Affairs (Wildlife Service)	1983	1990				
Rangitikei	Fish & Game	1984	1993				
Mataura	Fish & Game	1984	1997				
Manganui-o-te-Ao	Minister of Internal Affairs (Wildlife Service)	1986	1989				
Grey	Fish & Game	1987	1991				
Buller	Fish & Game	1987	2001				
Mohaka	Fish & Game	1987	2004				
Kawarau ⁴⁵	Minister of Conservation	1990	1997				
Motueka	Fish & Game	1990	2004				
Water conservation orders under the Resource Management Act							
Whanganui	Royal Forest & Bird Protection Society	1993	pending ⁴⁶				
Rangitata	Fish & Game	1999	2006				
Oreti ⁴⁷	Fish & Game	2005	2008				
Hurunui	Fish & Game / Whitewater NZ	2007	withdrawn				

Table 4.1: Water conservation orders for rivers.

How a water conservation order is established

An application for a water conservation order is made to the Minister for the Environment. If the application is accepted, the Minister appoints a special tribunal to hear evidence and submissions. The tribunal makes a recommendation to the Minister who subsequently makes the decision about whether or not to grant the water conservation order.⁴⁸

A water conservation order can be amended or revoked as little as two years after it has been created, but is still a very significant deterrent to hydroelectric development. No order has been significantly weakened to date.⁴⁹

The process for a water conservation order can be lengthy and expensive. Legal fees and the cost of expert advice can amount to hundreds of thousands of dollars. The water conservation order on the Rangitata River cost the applicant (Fish and Game) \$543,000 and those submitting against the application would have also spent a significant amount.⁵⁰ Added to that are the costs involved in setting up and administering a separate tribunal for every water conservation order.

It is therefore not surprising that most of the applications for water conservation orders have been made by Fish and Game; it is the only organisation which has committed significant funding for river protection. The result is that wild and scenic rivers have not been systematically protected. Instead there has been an inevitable focus on protecting those wild and scenic rivers valued for recreational fishing.



Figure 4.2 The Buller River has been protected by a water conservation order since 2001.

Regional rules, district plans, and water conservation orders

Before 1991, regionally significant wild and scenic rivers could be protected through local water conservation orders. With the enactment of the RMA these local orders were incorporated into regional rules.

Councils can still protect wild and scenic rivers through regional rules and district plans. District plans must be consistent with regional rules. However, both of these can be readily amended through a plan change.

In contrast, provisions protecting a river through a water conservation order have a top down effect making an order a much stronger mechanism for protection. This is because regional rules and district plans must be consistent with the provisions in a water conservation order.



Source: Parliamentary Commissioner for the Environment archives

Figure 4.3 The Waiohine Gorge is administered by the Wellington Regional Council.

The rivers and stretches of rivers covered by water conservation orders in the North Island and the South Island are show in Figure 4.4 and 4.5.

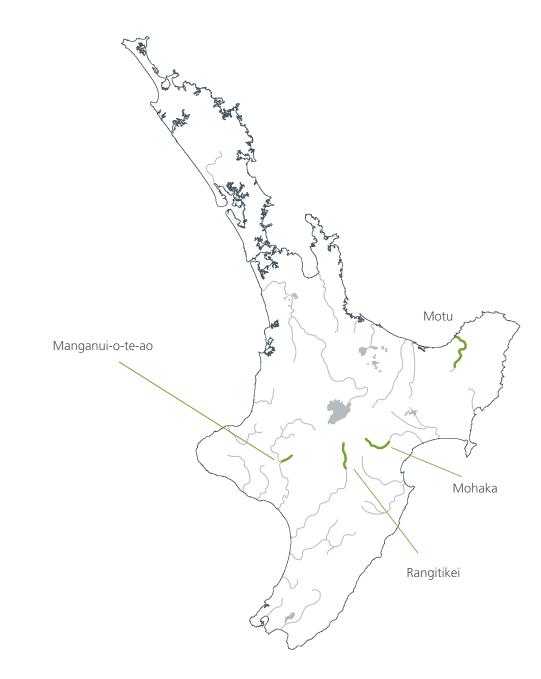


Figure 4.4 Stretches of rivers covered by water conservation orders in the North Island.

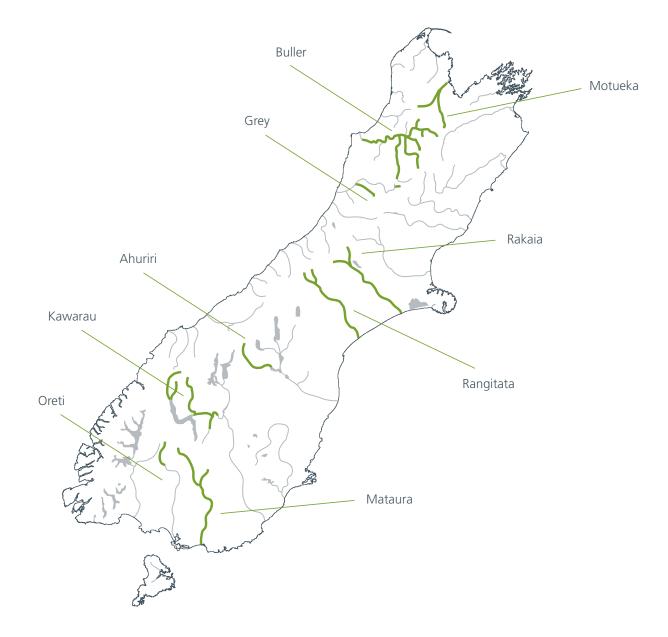
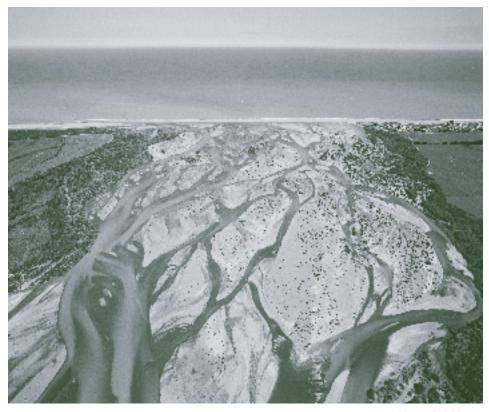


Figure 4.5 Stretches of rivers covered by water conservation orders in the South Island.

Water conservation orders in Canterbury

In 2010 the Government passed legislation that replaced regional councillors in Canterbury with appointed Commissioners. This legislation included a different way of responding to water conservation orders. The purpose of an order was changed from protecting "outstanding amenity or intrinsic values" to promoting "sustainable management".⁵¹

This change led Fish and Game to withdraw their application for a water conservation order on the Hurunui River.⁵² It has also led to TrustPower applying to amend the water conservation order on the Rakaia River.⁵³ The provisions affecting water conservation orders in Canterbury are due to expire in 2013.⁵⁴



Source: GNS Science

Figure 4.6 Rangitata from above, one of only two water conservation orders applied for and accepted since 1991.

4.2 Protecting rivers flowing through conservation land

Wild and scenic rivers running through conservation land are protected to varying degrees. Today conservation land covers one third of New Zealand. The level of protection varies by the classification of the land and how it is administered by the Department of Conservation, with just over a third of conservation land in national parks (see Figure 4.6).

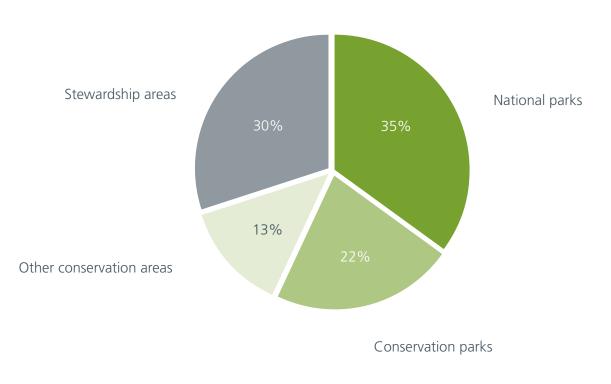


Figure 4.7 The distribution of different types of conservation land.

Source: DOC GIS data

How river protection varies by land classification

Since the Conservation Act in 1987, rivers across the entire conservation estate have been protected to some degree. How strongly a particular river is protected depends on the category of conservation land through which it flows, and the purpose for which the land is held. Consequently it is impossible to get permission for a hydroelectric scheme on some rivers within the conservation estate, but possible on others. For instance:

Wilderness areas must be preserved in their natural state. For example, no tracks, huts or any other structures can be built in a wilderness area.

National parks are also highly protected from development. The land and rivers must be preserved in a natural state.

Reserves are set aside for the preservation of representative natural ecosystems including the natural character of riverbanks. The purpose of the Reserves Act 1977 is the "preservation of representative samples of all classes of natural ecosystems and landscape", which in many instances will include rivers.⁵⁵

Conservation parks are managed for recreation as well as natural heritage. That means specific regard would likely be had for recreational activities on wild and scenic rivers within conservation parks.

While it would be almost impossible to get permission for a hydroelectricity scheme in wilderness areas or national parks, some schemes may be possible in reserves and conservation parks.

There are many other categories not listed above, but these generally encompass small areas of conservation land. However, there is also a substantial area of the conservation estate (a third) that has never been classified – stewardship land.

Stewardship land

Stewardship land is a category of conservation land that has a significantly different legal status from all others. This makes it much more attractive for commercial development. Rivers that run through stewardship land include the Mokihinui River and the Mararoa River in Southland.

In the reform of Crown land tenure in the 1980s, some land was temporarily put into the conservation estate, pending systematic assessment of its conservation value and reassignment to other categories. A former Minister of Conservation described this land as having been left in a *"statutory holding pen – until it could be assessed and, if merited, given more precise statutory protection"*.⁵⁶ This assessment has not occurred and stewardship land still makes up about a third of the conservation estate (see Figure 4.5).

It is much easier to get permission for a hydroelectric scheme on a river that flows through stewardship land than for other rivers on the conservation estate. The reasons for this are explained in the next chapter.





Rivers flowing through the conservation estate in the North Island and the South Island are shown in Figures 4.9 and 4.10.

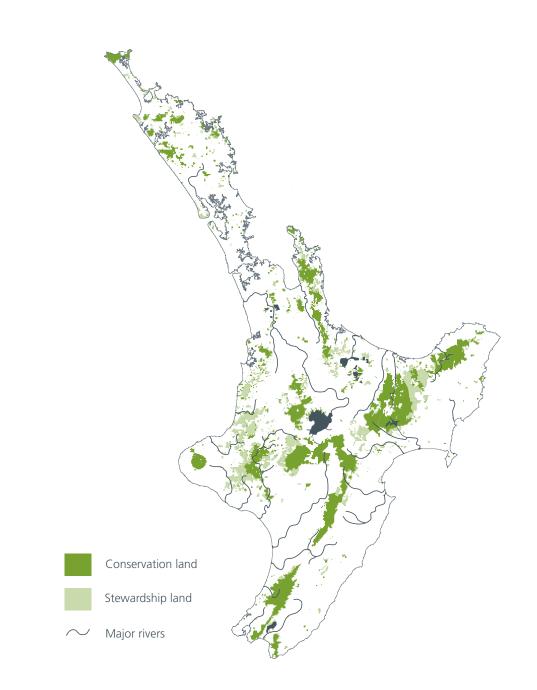


Figure 4.9 Rivers flowing through the conservation estate in the North Island.

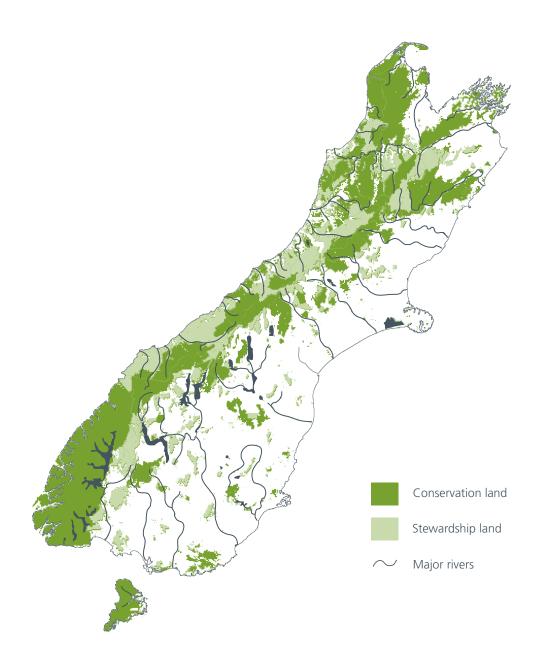


Figure 4.10 Rivers flowing through the conservation estate in the South Island.

Chapter 4 – Protecting wild and scenic rivers



The electricity or the river - how the choice is made

From the awe and power of a hydroelectric dam to the magic of the seething rapids of a wild river, both have their place. Yet making the decision when these two environmental goods come head to head relies on a complex system of legislation, institutions, and processes. This chapter describes how this system operates.

Two laws are pivotal in governing decisions about whether or not a hydroelectric power plant should be built on a wild and scenic river. They are the Resource Management Act 1991 (RMA) and the Conservation Act 1987.

There are two sections in this chapter.

The first section describes the process of obtaining resource consents to build a hydroelectric power plant under the RMA.

The second section describes the process of obtaining agreement to build a hydroelectric scheme on the conservation estate under the Conservation Act.

5.1 Obtaining resource consents

The process

Under the RMA, a company seeking to build a hydroelectric scheme on a river must obtain a number of resource consents from local councils.⁵⁷ The river may be protected under a water conservation order or in the local plans. If this is the case the proposal would have to comply with the conditions of those protections.

If there is no explicit protection the developer follows the normal consent process. Consents that would be required typically include:

- Consents from the regional council to take and use the river water and to modify the bed of the river
- Consents from the district council to clear vegetation, build roads, and construct the power station.

Many consents can be required. For example, Meridian Energy applied for a total of 34 resource consents to build its proposed scheme on the Mokihinui River.⁵⁸

Councils often refer an application for a large complex development to a panel of hearings commissioners. The decision, whether made by the councils or the hearings commissioners, can be appealed to the Environment Court.⁵⁹

In the application for the hydroelectric power plant on the Mokihinui River, the West Coast Regional Council and Buller District Council referred the application to a panel of three Hearings Commissioners who made a split 2:1 decision in favour of the application. It was appealed to the Environment Court but Meridian withdrew before the case was heard.⁶⁰

When resource consents are granted, they are almost always accompanied by a set of conditions that are intended to control the environmental impact of the development.

Making the judgement

The purpose of the RMA is to "promote the sustainable management of natural and physical resources".

One difficulty in making a judgement is that sustainable management lacks a precise definition, and indeed always will. In practice, an overall judgement is made as to whether or not a proposed development is consistent with the concept of sustainable management.⁶¹ Many factors are considered in making this evaluation, including social, economic and cultural factors, as well as effects on the environment. There are some factors that are particularly pertinent to proposals for hydroelectricity developments, and these are found in ss 6 and 7 of the RMA.

Section 6 of the RMA requires decision-makers to protect rivers and their margins from inappropriate development.⁶² Thus a judgement must be made as to whether a hydroelectric power plant is an "*inappropriate development*".

Section 7 of the RMA requires decision-makers to pay particular attention to renewable energy and the effects of climate change.⁶³ Hydroelectricity is classed as a renewable form of energy. Moreover, generating electricity using flowing water is not accompanied by significant emissions of carbon dioxide, so a hydroelectric power plant assists New Zealand to meet its international climate change obligations. The Supreme Court has interpreted climate change provisions in the RMA so that only the benefit, not the cost, may be considered.⁶⁴



Source: Andrew Cooper, 2009

Figure 5.1 Benmore in Canterbury is the second largest hydroelectric power station in New Zealand.

Providing guidance to decision-makers

Under the RMA there is a way for central government to direct the policy of councils. These are known as national policy statements (NPSs).⁶⁵

There are two NPSs that contain relevant objectives to hydroelectricity proposals – the NPS on Renewable Electricity Generation and the NPS on Freshwater Management.

The NPS on Renewable Electricity Generation states "Decision-makers shall recognise and provide for the national significance of renewable electricity generation activities, including the national, regional and local benefits relevant to renewable electricity generation activities."

The objective of the NPS on Freshwater Management is the protection of "*water* bodies with outstanding values, including ecological, landscape, recreational and spiritual values". It also includes electricity generation as a "national value" of fresh water.

The guidance in these NPSs is influential in two ways. First, any local authorities' planning documents must be changed to give effect to the NPSs.⁶⁶ And second, the NPSs must be considered by any council or court when deciding on resource consent applications, including a hydroelectricity plant on a wild and scenic river.⁶⁷

5.2 Getting agreement to build on conservation land

If a proposed hydroelectric power plant is to be built on (or inundate) conservation land, the applicant must get agreement from the Minister of Conservation. This is additional to, and separate from, the process for obtaining resource consents.

There are two main ways in which a developer can go about building a hydroelectric plant on land that is in the conservation estate – through a *concession* or through a *land exchange*.

A concession is permission to use the land for a commercial purpose. A land exchange is a process to transfer an area of conservation land into private ownership. Once it is privately owned, the Conservation Act no longer applies.

Deciding whether to grant a concession

Anyone who wishes to set up a business on the conservation estate – be it mountain guiding, a hydroelectric scheme, or any other commercial use – must obtain a concession for permission to use the land.⁶⁸

The Minister of Conservation can only give permission to build and operate a hydroelectric scheme on the conservation estate if it:

- would not compromise the purposes for which the land is held
- could not reasonably be done elsewhere, including in another conservation area where the effects would be less significant.⁶⁹

The Minister must also consider the impact of any structure, along with what might be done to reduce its impact.⁷⁰ The activity should be consistent with the Department of Conservation's management strategies and plans.

Deciding whether to agree to a land exchange

A land exchange is sometimes a possible alternative to a concession for a hydroelectric scheme if the developer can acquire the riverbed and its surrounding land by exchanging it for another piece of land. This can only be done if the conservation land is categorised as stewardship land.⁷¹

The Minister of Conservation is able to agree to areas of stewardship land being exchanged for areas of private land provided there is an overall conservation benefit. This is the only legal consideration, and the Minister is not required to consider the purpose and effect any proposed hydroelectricity scheme may have on the land.⁷²

Once the land is privately owned by the developer, there is no need for a concession. Nor is there any requirement for public notification and consultation by the Department of Conservation (DOC).

A company that wishes to build a hydroelectric scheme using a land exchange has a greater chance of success if the riverbed is administered, not by DOC, but by Land Information New Zealand (LINZ). There are a significant number of rivers that flow through the conservation estate with riverbeds administered by LINZ on behalf of the Crown.

In such a case, the Minister of Conservation cannot consider the conservation value of the river itself because the riverbed is not part of the land exchange. After an exchange is completed, LINZ usually grants an easement for use of the riverbed.

Most wild and scenic rivers that flow through the conservation estate are protected to a high degree. However, this is not the case for rivers that flow through stewardship land, particularly when DOC is not the administrator of the riverbed.

The Mokihinui is a case in point – the river flows through stewardship land and the riverbed is administered by LINZ. Thus, in considering any land exchange proposal, the Minister of Conservation can not take the river itself into account, even if the river is the most important feature of the lands being exchanged.

In summary

For a hydroelectricity scheme on any river, resource consents are required under the RMA.

But if the river flows through the conservation estate, agreement from the Minister of Conservation is also required.

These two processes are very different with different purposes. The two permissions can be sought in any order, or concurrently.



Environment versus environment

Earlier chapters of this report have described how New Zealand policy and legislation has evolved to deal with difficult choices between the two environmental 'goods' of hydroelectricity schemes and the preservation of wild and scenic rivers. From this point on, the report moves beyond describing how such choices are made to analysing the legislation and policy that guide these choices.

This chapter has two parts. The first part describes the significant environmental issues that should be considered when decisions are to be made about whether or not to allow hydroelectricity generation on a wild and scenic river. The second part puts these issues into a wider context, providing some guidance about how they should be considered.

6.1 What are the environmental benefits?

Wild and scenic rivers

There are many dimensions to the value of a wild and scenic river. These include:

- different forms of the river itself such as waterfalls, gorges, oxbows, and estuaries
- the native plants and animals that live in the river
- the native plants and animals that live alongside the river
- geological features such as layers of different coloured strata
- recreational opportunities such as kayaking, rafting, and hiking
- the historical significance of the river
- the spiritual significance to iwi.

These different kinds of value can be described and classified into categories such as scenic, recreational, geologic, biological, and cultural. However, such dissection and classification will always be inadequate because the whole is more than the sum of the parts.

The core value of a wild and scenic river lies in its relatively untouched state, in its character and integrity. Rivers that flow all the way unimpeded from the mountains to the sea are becoming rare. The spiritual significance of a river - awa - to iwi rests in the river as a whole. And there is something special about sitting beside a river that is not only beautiful but untamed.

Of course, the damage done to a wild and scenic river by a hydroelectric power scheme depends on how wild and scenic the river actually is, and on the type of scheme.

The greatest damage to such a river is done by a power scheme that has a dam and a storage lake, as this changes the character of a river irrevocably.



Source: Parliamentary Commissioner for the Environment archives

Figure 6.1 Waiohine River in the Tararua Forest Park (Wairarapa). In the past there have been proposals for hydroelectric development on this river.

Hydroelectricity

Hydroelectricity is classed as a renewable form of energy, in contrast with the non-renewable electricity generated from thermal power plants that burn gas or coal. This is because the water that flows through a hydroelectric turbine is 'renewed' – the water keeps flowing – in contrast with gas or coal being used up. Many hydroelectricity schemes are not renewable, however, in the sense that the landscape and ecology does not renew. Features and qualities of a river can be irreparably lost. The main environmental benefit of hydroelectricity is not therefore its renewability, but rather that it is a 'low carbon' form of energy.

When gas and coal are burned, carbon dioxide – the major greenhouse gas – is emitted. About 10 percent of New Zealand's greenhouse gas emissions come from the generation of electricity – from thermal power plants. Thus, the addition of a new hydroelectric power plant to the grid should result in lower carbon dioxide emissions and assist New Zealand to meet its international climate change commitments.

Hydroelectricity is a relatively 'low carbon' form of energy, but it is not 'zerocarbon'. How 'low carbon' a particular hydro scheme is depends on many factors. Hydroelectric dams are typically built out of concrete, and concrete is a particularly carbon-intensive material. If a storage lake is created by a dam, drowned plants will no longer grow by absorbing carbon dioxide from the air, and as they decay will emit carbon dioxide and methane, a potent greenhouse gas.



Source: Parliamentary Commissioner for the Environment archives

Figure 6.2 The Mangahao dam in the Manawatu was the first proposed in 1904 but was delayed at the start of construction. The station was opened in 1924. On the other hand, the ability to store water in a hydro lake may mean that less gas need be burned at peak times, and the strategic location of a power plant may mean lower transmission losses.

A standard way of measuring the carbon footprint of a low carbon energy source is the carbon payback time. For example, Meridian Energy estimated that the carbon payback time for the Mokihinui dam would have been 1-2 years.⁷³ This is the time the power station would have to operate to 'save' the amount of carbon dioxide emitted as a consequence of its construction.

There are a number of social and economic benefits associated with hydroelectricity schemes. These include the new recreational opportunities that storage lakes provide and the interlinked benefits from an addition to the electricity system. The latter may include improved security of supply, less need for transmission upgrades, and possibly lower electricity prices for some, though any new generation would provide these benefits.



Source: Benchill, 2010

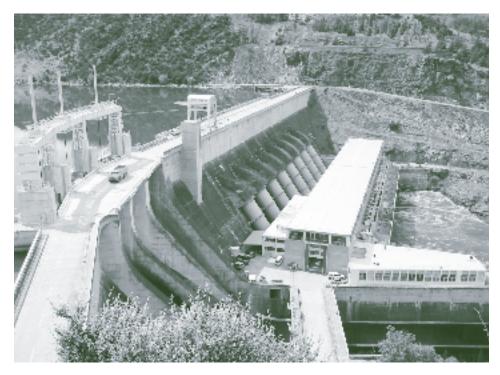
Figure 6.3 The Waipori dam near Dunedin was commissioned in 1907. The name Waipori means 'dark water'.

6.2 Comparing the two - a different approach

It seems obvious that a choice between the two environmental 'goods' should be made by comparing the benefits or value provided by each. But how easy is this? How can the low carbon benefit of a hydroelectric plant built on a wild and scenic river be weighed against the damage it may do to the river?

The benefits provided by a hydroelectric power plant can be measured in dollars. Obviously this is so for the economic benefits, and there are likely to be social benefits in the form of local employment and potentially lower electricity prices. Even the low carbon benefit can be quantified in dollars because the Emissions Trading Scheme puts a price on carbon dioxide emissions. Perhaps the only benefit that cannot be measured is the enhanced recreational opportunity provided by a storage lake, and that is likely to come at the cost of lowering the white water experience of kayakers and rafters.

The value of a wild and scenic river could not be more different. The preservation of an experience of wilderness for generations to come cannot be quantified, let alone measured in dollars. New Zealand's conservation heritage undoubtedly has great economic value; it is the basis of our largest export earner - tourism⁷⁴- and adds value to many other goods and services. But attempts to measure this value are tortuous and always able to be challenged because they rest on so many assumptions and are rife with uncertainty. The same can be said for attempts to quantify the value of biodiversity.



Source: CJMoss, 2009

Figure 6.4 Roxburgh power plant in Central Otago was built in the 1950s.

The value of a hydroelectric scheme and the value of a wild and scenic river are simply not comparable in any objective way.

But there is another approach. Since both environmental 'goods' are valuable, it would be desirable to have both low carbon electricity and wild and scenic rivers. This can be thought about in terms of two concepts – *alternatives* and *reversibility*.

Clearly, there are many alternative ways of reducing carbon dioxide emissions into the air, ranging from other hydroelectric power plants, other low carbon energy sources such as wind farms, all the way through to technologies that reduce energy consumption.

In contrast, wild and scenic rivers are becoming increasingly scarce around the world as they are modified for flood control and used for irrigation and hydroelectricity. It is a truism of economics that increasing scarcity leads to increasing value.



Source: Matt Pilott



However, if the damage done to a wild and scenic river by a hydroelectric scheme is reversible, then it is less serious. A scheme that involves little more than placing some turbines in the flow of the river is reversible. Future generations may choose to remove the turbines and restore the river.

Moreover, if a decision is made to *not* build a dam, the river remains and the decision can be revisited.

This approach to thinking about the two environmental 'goods' seems to lead inexorably to favouring the protection of a wild and scenic river over a hydroelectric dam. But this is not necessarily the case. A decision-maker faced with the choice must still reach a judgement on just how 'wild and scenic' a particular river is, and the extent of the damage that would be done to it by a proposed hydroelectric scheme.

6.3 In conclusion

This chapter is based on the concept of a choice between the two environmental 'goods' being made by a single decision-maker. This imaginary decision-maker is unconstrained by existing legislation and policy, and is rational, thorough, and even-handed.

On the one hand hydroelectricity helps New Zealand reach its target of 90% renewable electricity by 2025 and supports its 'clean and green' image. Yet while the scenic rivers are also part of that clean green image, there is a fundamental aspect which is that once altered a wild and scenic river cannot be remade.

The next chapter takes the analysis back to the system under which real choices are made between building hydroelectric dams and preserving wild and scenic rivers in New Zealand. How well do existing legislation, policy and institutional structures allow for a rational, thorough, and even-handed exploration of these kinds of difficult choices? And is it practical to make changes that would make the system closer to the theoretical ideal?



Resolving the dilemma - how the system measures up

This chapter analyses the system of legislation, institutions, and processes that govern whether or not a hydroelectric scheme can be built on a wild and scenic river. This chapter contains four sections.

The first compares how hydroelectricity and wild and scenic rivers are treated in the resource consents process.

The second examines the extent to which water conservation orders adequately protect wild and scenic rivers.

The third critiques how permission is granted for hydroelectricity developments under the Conservation Act.

The fourth describes the confusion and inefficiency that can occur between the RMA and the Conservation Act processes.

7.1 The favouring of hydroelectricity

A hydroelectric scheme has a great intrinsic advantage over the protection of a wild and scenic river. In the language of economics, electricity is a private good; there is money to be made from its generation and sale. In contrast, the protection of a wild and scenic river is a public good that requires government intervention. But the consent process itself adds to this advantage.

Special recognition of renewable energy

Hydroelectricity is classed as a renewable form of energy. Applications for renewable energy developments are given special recognition under the RMA in two ways. Particular attention is to be paid to renewable energy⁷⁵ and the effects of climate change.⁷⁶ It is the NPS on Renewable Electricity Generation which in particular strengthens the hand of hydroelectricity over wild and scenic rivers.

While wild and scenic rivers are not specifically mentioned in the RMA outside of water conservation orders,⁷⁷ the natural character of rivers and their margins is considered in the consent process.⁷⁸ But there is no counterbalance to the preference provided in the NPS on Renewable Electricity Generation. The counter might have been the NPS for Fresh Water Management but the latter has an implementation date of 2030 and also lists hydroelectricity as a "*national value*".⁷⁹

The imbalance created by the two NPSs is accentuated because they must also be considered when deciding on whether a water conservation order should be granted.⁸⁰

Consideration of alternatives

When an application is made for resource consents for a hydroelectric scheme, or indeed any other development, alternatives can be considered.⁸¹ Because resource consents are issued by councils who only have power within their own jurisdictions, the courts have interpreted the alternative to a power station as being the same kind of station within the same region.⁸² For instance, alternatives to the Mokihinui dam would only include other hydroelectricity options in the Buller District.

In reality, the range of real alternatives to any proposed hydroelectric development is very broad because all types of power stations across the country are connected through the national grid. The reduction in carbon dioxide emissions provided by a particular hydroelectric scheme can be provided not only by hydroelectricity generation elsewhere, but by geothermal stations, wind farms, upgrading transmission and distribution lines, and by reducing electricity demand through more efficient use.

This is a problem for which solutions could be found, but it is not easy. Finding a system to genuinely consider alternatives to a proposed power plant is beyond the scope of this report. But it is worthy of further investigation.

As a starting point the consent process under the NPS on Renewable Electricity Generation does not consider the irreversibility of a hydroelectric scheme on a river. Taking irreversible damage into consideration would encourage lower impact alternatives.



Source: Parliamentary Commissioner for the Environment archives

Figure 7.1 Project West Wind, Makara, Wellington.

7.2 Problems with water conservation orders

Water conservation orders are the main way to protect the wild and scenic values of rivers that do not flow through the conservation estate. They do not necessarily stop hydroelectricity generation on a river. Rather, they set out clear conditions on what kind of development is acceptable and where. Water conservation orders allow the special qualities of some rivers to be recognised and protected.

There are only 13 rivers protected by water conservation orders and only four of these are in the North Island. Moreover, there have been only four applications for water conservation orders in the last two decades – over a time in which appreciation for the natural environment has grown among New Zealanders.



Source: Parliamentary Commissioner for the Environment archives

Figure 7.2 Mokihinui Gorge. A controversial proposal to build a hydroelectric dam was withdrawn in May 2012.

Water conservation orders cost too much and take too long

When an application for a water conservation order is made, a special 'one-off' tribunal must be established to hear extensive legal and planning evidence from the applicant and interested groups and individuals. Consequently, the cost of lodging an application for a water conservation order is daunting. One of the only two successful applications lodged since 1991 – the Rangitata – cost the applicant over half a million dollars. Most of this was spent on paying lawyers, planners, and scientists.⁸³

It can take many years from the initial application to the granting of a water conservation order. The longest time was 17 years – for the Mohaka River in Hawke's Bay. This not only increases costs but ties up other resources for years.

Local protection is no substitute for water conservation orders

A river can be protected in council plans under the RMA.⁸⁴ For instance, a rule can be written in a regional plan that would prohibit a wild and scenic river from being dammed.⁸⁵ Such a rule would also filter down into district plans.⁸⁶

However, relying on this is problematic because it requires a river to have been fully assessed by a council for its wild and scenic values. Moreover, this type of protection is not permanent and it is unrealistic to saddle most councils with the task of fully assessing the wild and scenic value of a river. It is telling that the majority of the 'no damming' provisions in regional plans are a result of the now defunct local water conservation orders under the Water and Soil Conservation Act.⁸⁷

Different kinds of value provided by wild and scenic rivers

Most water conservation orders have been applied for by Fish and Game (see Table 4.1) because it is the only organisation which has dedicated sufficient resources for applications. Naturally Fish and Game is focused on the value of rivers as trout and salmon fisheries. But many wild and scenic rivers are not valued for sport fishing, meaning they might miss out on protection.

While a schedule of protected rivers has been raised a number of times by government over the past 30 years, no 'set' of wild and scenic rivers has been systematically protected. The New Zealand Conservation Authority has suggested in its recent report on rivers that a more strategic approach is needed for making applications for water conservation orders.⁸⁸

A strategic approach

The challenge is to find a more strategic approach that allows for a recognition of the wider value of wild and scenic rivers, costs less, and does not take so long.

Fish and Game is not the only organisation with the expertise to apply for water conservation orders. Conservation organisations, iwi, regional councils, and DOC are all potential applicants.⁸⁹ But gathering expert evidence for a specific application is very expensive.

The National Institute of Water and Atmospheric Research has developed a GISbased environmental classification of New Zealand's rivers, and DOC has developed a freshwater database that contains more biological data.⁹⁰ This data could be readily used, perhaps by the Land and Water Forum, to give guidance about which wild and scenic rivers would be good candidates for water conservation orders. And if guidance on applications and data about a particular river can be made available to applicants and submitters, then there is potential to significantly cut the cost of making an application.

The creation of a special tribunal to hear each application must also add to costs.⁹¹ There is an opportunity here with the recent creation of the Environmental Protection Authority (EPA). The EPA could set up a standing tribunal to hear applications and a precedent exists for a single body to have this responsibility.⁹² Such a tribunal (which might be a subcommittee of the EPA Board) would become experienced in evaluating the merits of different rivers. And since a time limit has been set for dealing with applications for resource consents, a similar time limit could be set for applications for water conservation orders.



Source: J. Farquhar

Figure 7.3 The land surrounding the Ngakawau River near Westport was classified as stewardship land. In 1993, a hydroelectric scheme was proposed for this river but did not get agreement from the Minister of Conservation. The river has since been included in an ecological area.

7.3 Loopholes in the Conservation Act process

There are two ways in which the Minister of Conservation can agree to a hydroelectric scheme to be built on a river currently flowing through the conservation estate (see 5.2). The first way is to grant a concession. The second way is to agree to a land exchange.

The latter is more appealing to developers because once the land exchange has taken place, there is no need for any conservation protection beyond meeting the conditions in the resource consents. This might be entirely reasonable or it might not. But there are two loopholes in the Conservation Act process that can undermine the logic of land exchanges.

Stewardship land remains largely unvalued

The only category of conservation land that is able to be exchanged for an area of private land is stewardship land.⁹³ Such an exchange can take place if the Minister of Conservation considers there is a net conservation benefit.⁹⁴ Such a benefit might be the addition of an under-represented type of ecosystem to the conservation estate.⁹⁵

However, as discussed in 4.2, stewardship land has never been systematically assessed. That stewardship areas are necessarily of lesser value is a misconception.⁹⁶ It is, however, a widely held view. And it should come as no surprise that developers assume areas which can be more easily exchanged and developed than other areas are in fact of low conservation value.

The now defunct proposal to build a hydroelectric scheme on the Mokihinui River again illustrates this. The Mokihinui flows through stewardship land, and this clearly signalled to Meridian Energy that it is of low value.

An important fact of this project is that the area affected by the scheme is stewardship land... [it's] not in a national park, it's not in an ecological reserve or specially protected area. The river doesn't have a water conservation order on it. Given all the hoo-ha about national parks recently, I think it's quite an important point.⁹⁷

However, DOC clearly regards the Mokihinui and the land through which it flows to be of high conservation value, since it appealed the resource consents in the Environment Court.

A systematic classification of all areas of stewardship land could be a lengthy, expensive, and fraught process, which may be the reason it has never been done.⁹⁸ There is no urgent need for all stewardship areas to be reclassified, but there must be some areas that are obviously of high value and these could be treated as priorities. A 'stitch in time' should prevent a replay of the Mokihinui situation.⁹⁹

The river can be ignored

DOC does not 'administer' many of the beds of the rivers that flow through the conservation estate. The result is that the conservation value of the river itself cannot be considered in a land exchange.¹⁰⁰

The administrator of these riverbeds is LINZ, through the Commissioner of Crown Lands. LINZ is mainly responsible for mapping and managing Crown lands defined as 'farm land', 'urban land' and 'commercial land', and is not required to consider the conservation value of the riverbeds (and consequently the rivers) when granting occupation rights.¹⁰¹

In such cases, DOC can only take into account the conservation value of land on either side of the river. This makes no sense; the value of a wild and scenic river is the river in its totality – the water, the riverbed, and the land through which the river flows.

The Mokihinui River again serves as an example. Its riverbed is administered by LINZ. DOC could not have included the effect on the river in its assessment of what would be lost were the dam to be constructed. In this situation a land exchange would be precisely what it says – an exchange of land with the river itself taken as of no conservation value.



Source: Parliamentary Commissioner for the Environment archives

Figure 7.4 The Mokihinui River on the West Coast flows through stewardship land on the conservation estate.

7.4 Two different processes - confusion and inefficiency

Two separate processes are generally needed to build a hydroelectric scheme on a river that flows through the conservation estate:

- obtaining resource consents under the RMA
- obtaining permission under the Conservation Act through a concession or possibly a land exchange (if the river flows through stewardship land).

The two processes can take place in either order or at the same time.

Consequently, a developer may secure resource consents, but not be granted a concession.¹⁰² This is a systemic problem because many commercial activities that take place on the conservation estate require resource consents as well as a concession.

When a developer secures resource consents, but is subsequently not granted a concession, time and resources have been wasted. Such situations are politically fraught as well; applying for resource consents first because it is unlikely a concession will be granted is 'gaming the system'. It also risks undermining the role of the Minister of Conservation as guardian of the conservation estate.

Moreover, in such a case, DOC can spend time and money submitting against a resource consent application, despite the Minister of Conservation holding the power to refuse to grant a concession.

This happened in the case of the Mokihinui, where DOC appealed the granting of the resource consents for the dam at doubtless significant public expense. Yet Meridian Energy would still have needed permission from the Minister to proceed with the dam even if the consents were confirmed by the Environment Court.

One approach to solving this problem is to require the developer to apply first for a conservation concession, and only after having secured it, to apply for resource consents.

DOC has looked into this, because it would:

... more clearly establish the different natures of the two forms of approval, and more clearly demarcate the Department's roles in each. It would also eliminate the risk of an applicant investing heavily in securing resource consent for an activity that is not granted a concession.¹⁰³

However, DOC rejected sequencing because it would:

... prevent any efficiency gains through coordination or synchronisation of the two processes and any contraction of the overall timeframe.¹⁰⁴

Another approach is to establish a joint consenting process, so that applications for resource consents and conservation concessions can be considered at the same hearing. This would improve efficiency by enabling the evidence on many of the environmental impacts to be heard once, and potentially reduce the time taken for the process. But if this reform were to occur, there are a number of risks that need to be managed.

First, when permission is given to use conservation land for a commercial purpose, the Minister of Conservation should act like a private landowner and seek to increase the value of the conservation estate. This can be done in many ways. A land exchange which gives a net conservation benefit is one way; a binding commitment to pest control is another. But if a single panel makes a decision on both the resource consents and the conservation concession, the Minister of Conservation loses her opportunity to negotiate.

Second, the role of the Minister of Conservation is very distinct from that of decision-makers in the resource consent process and should not be compromised. The core of the Conservation Act is the preservation of New Zealand's natural heritage. This is very different from the broader considerations in the RMA.

It is therefore critical that if the two *processes* are combined to some extent, that the two *decisions* are made separately.



Conclusions and recommendations

Hydroelectricity is a renewable form of energy and its generation is not accompanied by emissions of the greenhouse gas carbon dioxide. It can therefore be considered an environmental 'good'. A wild and scenic river is also an environmental 'good' for a host of reasons, including the pleasure we derive from its beauty. But when a hydroelectric scheme is built on a wild and scenic river, particularly if it involves a dam and the river is especially precious, these two very different environmental goods come into conflict.

Indeed, the value of a hydroelectric scheme and the value of a wild and scenic river could not be more different. The former can be measured in dollars, and under the Emissions Trading Scheme, even the environmental benefit of low carbon energy has a monetary value.

In contrast, the full value of a wild and scenic river cannot be captured in dollars or any other unit of measurement in any meaningful way – it is literally immeasurable. This is not to say it does not have economic value – it is our environment that draws tourists to New Zealand and leads many of us to holiday in our own country. And while New Zealand has many rivers that are still in a relatively pristine state, most of those are on the conservation estate and consequently few are in the North Island.

This chapter contains five recommendations aimed at improving the system of legislation, processes, and institutions within which choices between hydroelectric schemes and wild and scenic rivers are made. They cover the following issues:

- Creating a better balance between hydroelectricity and wild and scenic rivers
- Improving water conservation orders
- Reclassifying stewardship land through which wild and scenic rivers flow
- Rationalising the administration of riverbeds
- Streamlining the resource consent and conservation concession processes.

8.1 Achieve a better balance

Because hydroelectricity is a renewable form of energy, it is given a very explicit preference in the RMA process. This occurs within the RMA itself where decision-makers must "*have particular regard*" for renewable energy, and enhanced in the National Policy Statement (NPS) on Renewable Electricity Generation prepared under the RMA.

The NPS on Renewable Electricity Generation sets down renewable electricity as a matter of national significance, and does not distinguish between the effects different types of hydroelectric plants might have on a wild and scenic river. Typically, schemes involving dams and storage lakes have the greatest impacts and cause irreversible damage. In the NPS reversibility is considered to be a good thing, but irreversibility is *not* considered to be a bad thing.

The NPS on Freshwater Management does not redress this imbalance. In fact, it lists electricity generation as a "national value" and lacks an objective of preserving wild and scenic rivers.

Where the two NPSs may have counterbalanced each other, instead they favour developing hydroelectricity. The NPS on Renewable Electricity Generation does not sufficiently recognise the irreversible damage of some renewable electricity proposals.

And the NPS on Freshwater Management does not explicitly recognise the value of preserving wild and scenic rivers.

I recommend that:

 The Minister for the Environment direct her officials (or the Land and Water Forum) to consider how the NPS on Renewable Electricity Generation or the NPS on Freshwater Management can be amended to better recognise the value of wild and scenic rivers.

8.2 Improve protection of wild and scenic rivers

Water conservation orders are the most effective way to protect a wild and scenic river that does not flow through the conservation estate.

Applications for water conservation orders have become rare. In the last 21 years there have been only four, and of these only two have been successful. The process is long and expensive. The applicant for most water conservation orders has been Fish and Game – an organisation primarily mandated to protect rivers that are good for sport fishing.

Conservation organisations, iwi, DOC, and regional councils all have the expert knowledge required to apply for water conservation orders, but are presumably deterred by the expense and the time taken to go through the process. Given the move toward co-governance, iwi in particular are well-placed to apply for water conservation orders.

Often a wild and scenic river faces an imminent threat before anyone is spurred to apply for a water conservation order. A more proactive approach would create greater certainty for both developers and conservationists about which rivers should be open for hydroelectric schemes and which should not be. The Land and Water Forum could play a leadership role here by using existing data to draw up a list of important wild and scenic rivers that should be considered for protection. This list and associated data could be drawn on for applications which should reduce the cost of gathering evidence for both applicants and opponents.

The process of dealing with applications could be streamlined by shifting administration of, and conducting hearings through, the Environmental Protection Authority. Restricting the time that can be taken to deal with an application would encourage collaboration between parties and the gathering of evidence before an application was lodged.

I recommend that:

- 2. The Minister for the Environment direct her officials (or the Land and Water Forum) to:
 - a) investigate which wild and scenic rivers outside conservation land would be good candidates for protection with water conservation orders,

and

b) investigate streamlining the water conservation order process by requiring a decision within nine months of an application and the hearing of applications by the Environmental Protection Authority.

8.3 Reclassify stewardship land through which wild and scenic rivers flow

Wild and scenic rivers that flow through the conservation estate are generally well protected. Any proposed hydroelectric schemes are carefully considered through the concessions process.

However, about a third of the conservation estate falls into the category of stewardship land. Developments can occur on stewardship land without going through the concessions process. The land required for a development can be exchanged for an area of private land. Such an exchange must result in a net benefit to conservation; that is, the conservation value of the land that is added to the conservation estate must be greater than the conservation value of the stewardship land taken out of the conservation estate.

A land exchange faces a lower hurdle than a concession. Moreover, unlike applications for significant concessions, the public cannot raise their concerns about land exchange proposals.

Reclassification of stewardship land that has high conservation value will require effort and expenditure in the short term, but in the long term will provide greater certainty to developers and save costly, lengthy arguments about the conservation value of the land. The work now being done on the Natural Heritage Management System and the earlier work on Protected Natural Areas should be of use in such an exercise.

I recommend that:

3. The Minister of Conservation direct her officials to identify important wild and scenic rivers running through stewardship land and reclassify the land if they consider the rivers need protection.

8.4 Rationalise the administration of riverbeds

The riverbeds of many rivers that run through the conservation estate are administered by Land Information New Zealand (LINZ). The consequence is that these rivers are in effect not part of the conservation estate, so cannot be considered in land exchanges.

This is extraordinary. The value of a wild and scenic river lies in the totality of the river and the land through which it flows.

LINZ is the Crown's property manager and is concerned with land titles, mapping, and surveying, rather than conservation. It is an artifact of history that LINZ remains the administrator of the riverbeds of some rivers that flow through the conservation estate.

I recommend that:

4. The Minister of Conservation direct her officials to investigate transferring the administration of riverbeds located within conservation land to the Department of Conservation.

8.5 Streamline the resource consent and conservation concession processes

Where wild and scenic rivers are on conservation land, a developer wishing to build a hydroelectric scheme must obtain resource consents under the RMA *and* obtain approval under the Conservation Act. The two processes can take place in either order or concurrently.

This can inefficiency and uncertainty. An applicant may spend hundreds of thousands of dollars obtaining resource consents and then fail to gain approval for a conservation concession. The Department of Conservation can spend time and money opposing the granting of resource consents through its advocacy role, while expecting to decline a concession or land exchange further down the track.

There are two possible approaches to solving this problem.

The first is a sequencing option – requiring the applicant to gain approval under the Conservation Act before being able to apply for resource consents. Any amendment to legislation would be relatively straightforward compared with the second approach.

The second approach is to establish a joint process so that a single hearing of evidence is held. A potential drawback is that the Conservation Minister's ability to get the best possible return on use of the conservation estate would be undermined if she were to be bound by a joint consent–concession decision. Her role as guardian of the conservation estate could also be compromised. These problems could be addressed by ensuring that the Minister's concession decision is distinct and separate from that of the consent authority.

I recommend that:

- 5. The Ministers for the Environment and Conservation seek amendments to legislation so that either:
 - a) a commercial operation on conservation land must have approval under the Conservation Act 1986 before resource consents can be sought.

or

 b) a commercial operation on conservation land that requires resource consent is considered at a single concession-consent hearing, and that the concession and consent decisions are made separately.

Endnotes

- 1 Queensland Department of Environment and Resource Management. House of Representatives Inquiry into issues affecting Indigenous economic development in Queensland and review of the Wild Rivers (Environmental Management) Bill 2010.
- 2 Young, D. 2004. *Our islands, our selves*. University of Otago Press: 174-176.
- 3 Martin, J. (editor). 1998. *People, politics and power stations. Electric power generation in New Zealand 1880–1998*. 2nd ed. Electricity Corporation of New Zealand and Department of Internal Affairs: 16–17.
- 4 This was the Bullendale mine. Martin, 1998, p. 17.
- 5 Martin, 1998, p. 23.
- 6 A megawatt (MW) is equal to 1000 kilowatts (kW). A toaster typically draws 1kW of power so 1MW is the power used by about a thousand toasters. Of course, the Reefton plant was lighting the town at night, not powering a thousand toasters.
- 7 Martin, 1998, p. 214.
- 8 Salmon, J. 1960. *Heritage destroyed: The crisis in scenery preservation in New Zealand*. AH & AW Reed: 56.
- 9 Salmon, 1960, p. 56.
- 10 Control gates on the Waiau at Lake Te Anau and the confluence of the Mararoa River allow control over lake levels.
- 11 Martin, 1998, p. 278.
- 12 Martin, 1998, p. 282.
- 13 Commission for the Environment. 1977. *Wild rivers discussion paper*. p. 1.
- 14 *'Free flowing water possible in Kawarau'*, Otago Daily Times, 16 August 1977 [Minister for the Environment, Hon. Venn Young, speaking at a meeting of Ecology Action (Otago)]. He said that he, as much as anyone, regretted the loss of the magnificence of the Clutha River pouring through the Cromwell Gorge. He said that he was forming a national waterways policy where outstanding rivers or stretches of river will be preserved in free-flowing conditions for the recreation and *"scenic delight"* of future New Zealanders, like the Kawarau.
- 15 Electricity Authority. 2011. *Generating station list, October 2011*. Over 100MW of new generating capacity was added to old power stations between 2000–2010.
- Meridian abandoned Project Aqua, a planned diversion scheme on the south bank of the Waitaki River, citing rising costs and problems getting resource consents. See Meridian Energy. 'Meridian Announces Stop to Project Aqua', press release, 29 March 2004.
- 17 Martin, 1998, pp. 235, 286, 289.
- 18 Ministry of Economic Development. 2007. *New Zealand Energy Strategy 2007*.
- 19 Ministry of Economic Development. 2011. *New Zealand Energy Strategy 2011–2021*.
- 20 Ministry of Economic Development. 2011. *New Zealand Energy Data File*, p. 104. How much electricity is generated by hydroelectric power plants in any given year depends on the amount and location of rain during that year.

- 21 East Harbour Management Services (for the Ministry of Economic Development). January 2004. Waters of national importance – Identification of potential hydroelectric resources.
- 22 Contact Energy has abandoned plans for a dam on the Clutha River. The decision has been put down to the current financial climate. Other projects on hold include TrustPower's Arnold River scheme, though that is to be revisited in 2013.
- New Zealand Conservation Authority. 2011. Protecting New Zealand's rivers. Chapter3.
- 24 National Parks Act 1980, s 4(2)(a). Section 17W(1) of the Conservation Act 1987 also requires development applications to be consistent with the relevant conservation management strategy and plan.
- 25 Commission for the Environment. 1978. *Wild and scenic river protection*.
- 26 Young, 2004, p. 196 (via NZCA report: Protecting New Zealand's rivers).
- U.S. Fish and Wildlife Service. http://www.rivers.gov/ [Accessed 10 May 2012].
 (Legislation: Public Law 90-542; 16 U.S.C. 1271 et seq. 1968.)
- 28 U.S. Fish and Wildlife Service. *River mileage classifications for components of the October 2011 National Wild and Scenic Rivers System.* http://www.rivers.gov/ publications/rivers-table.pdf [Accessed 14 April 2012].
- 29 Initially drafted as the National Wild Rivers Bill
- 30 Local water conservation orders are now defunct, but their effect remains in Regional Plans (Resource Management Act 1991, s 368). The Rangitikei River was partly protected under a national water conservation order and partly under a local water conservation order.
- 31 National Water and Soil Conservation Authority. 1984. *National inventory of wild and scenic rivers*.
- National Water and Soil Conservation Authority. D.S. Grindell & P.A. Grant (eds).
 1986. A list of rivers and lakes deserving inclusion in a Schedule of Protected Waters: Report of the Protected Waters Assessment Committee.
- National Water and Soil Conservation Authority. D.S. Grindell & P.A. Grant (eds).
 1986. A list of rivers and lakes deserving inclusion in a Schedule of Protected Waters: Report of the Protected Waters Assessment Committee.
- Rivers flowing through stewardship land and are included. See 4.2. Some of these rivers do partially flow through Conservation Parks, which provide some protection.
- 35 While modified, the Hutt River Gorge between Kaitoke and Te Marua was classed as scenic and wild, good for recreation, and accessible to the population of the Wellington region.
- 36 Protection does not include rivers on stewardship land, partially flowing through Conservation Parks, or protections listed in local plans.
- 37 The aim was to identify important waterways deserving protection and imminent pressures on them.
- 38 Ministry for the Environment. *Sustainable water programme of action (2003–2008)*. http://www.mfe.govt.nz/issues/water/prog-action/index.html [Accessed 19 May 2011]
- 39 Ministry for the Environment. *Water conservation orders*. http://www.mfe.govt.nz/ issues/water/freshwater/water-conservation/ [Accessed 14 March 2012].

- 40 National Water Conservation (Motu River) Order 1984.
- 41 See, for instance, Water Conservation (Rangitata River) Order 2006.
- 42 With the enactment of the RMA, *local* water conservation notices were incorporated into regional rules.
- 43 The water conservation order on the Oreti river was applied for under the old legislation in 1987.
- 44 Most of the applications are listed as being made by Fish and Game New Zealand. Before 1990 when it was the Acclimatisation Societies.
- 45 The water conservation order on the Kawarau includes the Dart and the Shotover rivers as well as Lake Wakatipu.
- 46 The application for the WCO on the Whanganui is before the Waitangi Tribunal. http://www.waitangi-tribunal.govt.nz/reports/viewchapter.asp?reportID=09C81BD2-473F-4F11-81FB-E22EC2D75B5A&chapter=1 [Accessed 3 May 2012].
- 47 The Oreti was first applied for in 1987, but in the process became a local water conservation order.
- 48 The Tribunal makes a recommendation and notifies that recommendation to all parties and original submitters. If any additional submissions are received in relation to that recommendation, the Environment Court then conducts an inquiry and makes a recommendation to the Minister. Appeals to the High Court and beyond are only permitted on matters of law.
- 49 The Buller Water Conservation Order was amended in 2008 but was not significantly weakened. The Rakaia Water Conservation Order is currently under consideration of amendment by TrustPower. This change is now supported by the original applicant, Fish and Game.
- 50 Fish and Game. 2011. *Water conservation orders*. Fish and Game NZ, National Office, Legal Department.
- 51 Another change was that decisions on water conservation orders by the Commissioners cannot be appealed to the Environment Court. Environment Canterbury (Temporary Commissioners and Improved Water Management) Act 2010, s 52.
- 52 Fish and Game / Whitewater NZ. 20 December 2010. *Fish & Game and Whitewater NZ withdraw from Hurunui WCO*. http://rivers.org.nz/media/2010/fish-game-and-whitewater-nz-withdraw-from-hurunui-wco [Accessed 19 November 2011].
- 53 TrustPower applied in July 2011 to relax some of the restrictions of the Rakaia Water Conservation Order. See Ministry for the Environment. *Current applications for water conservation orders.* http://www.mfe.govt.nz/issues/water/freshwater/waterconservation/current-applications/ [Accessed May 2012].
- 54 Environment Canterbury (Temporary Commissioners and Improved Water Management) Act 2010, s 6(3).
- 55 Reserves Act 1977, s 3(1)(b),(c).
- 56 Woollaston, P. 23 August 2010. *Origins of the legislation and policy relating to minerals in conservation areas.* Institute of Policy Studies'' symposium: Mining in the conservation estate – Lasting lessons from the Schedule 4 debate. August 23, 2010.
- 57 Unless it is listed as a permitted activity in local plans.

- 58 This includes 26 consents from the West Coast Regional Council and 8 consents from the Buller District Council.
- 59 If a proposed development is deemed to be nationally important, it is 'called in' by the Minister for the Environment. The Minister will then refer the application to either a Board of Inquiry for decision or to the Environment Court for a decision (RMA, s 142(2)(a),(b)).
- 60 Since 2009, applications can be directly referred to the Environment Court or a Board of Inquiry (RMA, s 87).
- 61 Environmental Defence Society. *Principles of the RMA*. http://rmaguide.org.nz/rma/ introduction/principals.cfm?section=sustainablemgmt [Accessed 14 March 2012].
- 62 "Recognise and provide for the following matters of national importance: the preservation of the natural character of ... lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development." RMA, s 6(a) – Matters of national importance.
- 63 RMA, s 7(j) Other matters.
- 64 RMA, s 70A and s 104E and Greenpeace NZ Inc v Genesis Power Ltd [2008]. NZSC 112 found that the decision-maker should take into account mitigation of climate change as a positive factor supporting the application when considering applications for renewable generation by virtue of these sections.
- 65 RMA, ss 45 to 55.
- 66 This must be done within a certain timeframe: NPS on Renewable Electricity Generation – May 2013; NPS on Freshwater Management – December 2030.
- 67 RMA, s 104(1)(b)(iii).
- Typically, more than one concession is required.
- 69 Conservation Act 1987, ss 17U (3) and (4).
- 70 Conservation Act 1987, s 17U(1).
- 71 Conservation Act 1987, s 16A. Land classified as reserves can also be exchanged, under Reserves Act 1977 s 15, but reserves amount to a very small percentage of the conservation estate compared with stewardship land. In practice, land exchanges involving reserves have been small boundary adjustments.
- 72 There is no need for the effects on the land in question to be avoided, remedied, or mitigated beyond meeting any conditions in the resource consents. The developer may still need concessions to build infrastructure related to the development, such as transmission lines and roads.
- 73 Meridian Energy. *Memo to Parliamentary Commissioner for the Environment MHP Greenhouse Gas Emissions*. 7 December 2010.
- 54 Statistics New Zealand. Tourism Satellite Account: At a glance. 2011. Tourism expenditure to the year ending March 2011 was \$23 billion (international tourism was \$10b). It is New Zealand's largest export earner. See New Zealand Trade and Enterprise. Tourism. http://www.nzte.govt.nz/access-international-networks/Exploreopportunities-in-growth-industries/growth-industries/Pages/Tourism.aspx [Accessed 11 May 2012].
- 75 RMA, s 7 (j).
- 76 RMA, s 70A, s 140E, s 7 (i) and (j).

- 77 There is no specific mention of 'wild and scenic' but case law has defined characteristics that might afford a landscape 'outstanding' status (*Wakatipu Environmental Society v QLDC* [2000] NZRMA 59 (EC)). This test could merit a wild and scenic river being categorised with such status but requires the river to have been assessed and classified.
- 78 RMA, s 6A.
- 79 While the NPS on Freshwater Management lists the "natural form, character, functioning and natural processes of water bodies and margins, including natural flows, velocities, levels, variability and connections" as a value, there is no specific objective to protect wild and scenic rivers.
- 80 RMA, s 207C.
- 81 RMA, s 104(1)(c). Meridian Energy Ltd v Central Otago DC [2010] NZRMA 477 (HC) at para 123. "In the circumstances of this case the Environment Court was, subject to the qualifications mentioned in this judgment, authorised to call for a description of alternative sites as part of its s 104 analysis." Schedule 4, Clause 1(b) of the RMA also has a provision for considering alternatives: "Where it is likely that an activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity."
- 82 Meridian Energy Ltd v Central Otago DC [2010] NZRMA 477 (HC) at para 93. "Given that the functions of territorial authorities listed in s 31 are for the purpose of giving effect to this Act in its district we do not think that Parliament intended that applicants could be called upon to describe alternative sites beyond the relevant district."
- Fish and Game, 2011.
- 84 RMA, s 6(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.
- 85 RMA, s 30(1)e.
- 86 RMA, s 75(4)(b).
- 87 There are some examples of 'no dam' provisions that were not the result of local water conservation orders. For instance, the Canterbury Water Management Strategy has the goal of 'no new dams on the mainstem of major alpine braided rivers'. See Canterbury water management strategy: Strategic framework November 2009. http://ecan.govt.nz/publications/Plans/cw-canterbury-water-wanagement-strategy-05-11-09.pdf [Accessed 12 May 2012].
- 88 New Zealand Conservation Authority. 2011. Protecting New Zealand's rivers.
- 89 There is an opportunity for councils to clarify which rivers are open for development and which should be protected for their wild and scenic nature.
- 90 The River Environment Classification was developed by NIWA http://www.niwa.co.nz/ our-science/freshwater/tools/rec [Accessed 21 April 2012]

The Freshwater Ecosystems of New Zealand (FENZ) was developed by DOC http:// www.doc.govt.nz/conservation/land-and-freshwater/freshwater/freshwaterecosystems-of-new-zealand/ [Accessed 21 April 2012]

- 91 When water conservation orders were granted under the Water and Soil Act, the Planning Tribunal was able to conduct several inquiries together "*not withstanding that they relate to different rivers, streams, or lakes…*". Water and Soil Conservation Amendment 1981, s 20C(5).
- 92 Under the Water and Soil Conservation Act, water conservation order applications were heard by the National Water and Soil Conservation Authority.
- 93 Land classified as reserves can also be exchanged, but reserves amount to a very small percentage of the conservation estate compared with stewardship land. In practice, land exchanges involving reserves have been small boundary adjustments.
- 94 There is no requirement for public notification or consultation when a land exchange is considered (Conservation Act 1987, s 16A(7)).
- 95 Conservation General Policy 6(a), Department of Conservation, 2005.
- 96 For example, the Mavora Lakes Park in Fiordland is still classified as stewardship land despite being internationally recognised as part of a UNESCO World Heritage Area.
- 97 Meridian Project Manager, http://www.stuff.co.nz/nelson-mail/news/4269929/Damopponents-take-to-the-water, 25 October 2010.
- 98 "Some areas within public conservation lands would be better protected by reclassifying them with another status." The West Coast Conservation Management Strategy (3.8.2.2) Policy 1 says "The legal classification of public conservation lands containing significant freshwater ecosystems should be reviewed." This has been a draft policy since 1996 and Conservation Management Strategies are not binding nor is there a time limit for their implementation (Conservation Act 1987, s 17D(4)).
- 99 In 1989 the Mokihinui catchment was considered for inclusion in a proposed national park. However, after consultation with various groups the formal national park proposal excluded lands in the West Coast conservancy. There was too much uncertainty over the allocation and reclassification of lands on the West Coast at that time. The proposal became the Kahurangi National Park in 1996. In 2006 the Mokihinui catchment was included in a proposed heritage park on the West Coast, but this proposal subsequently was put on hold.
- 100 The Department of Conservation is operating on this legal assumption.
- 101 Land Act 1948, s 51(1).
- 102 The opposite can also happen, though it is much less likely. For instance, Fiordland Cruises Limited was granted concessions for operations in Fiordland National Park around Lake Manapouri, but did not get resource consent for operations in other parts of the lake because of effects outside the National Park.
- 103 Department of Conservation, DOCDM-571898, *RMA Conservation Act interface* (*Part 5*), 2011
- 104 Ibid