Kapiti Coast

State of Environment Report—1999

Executive Summary

This document reports on the state of the environment within the Kapiti Coast District and is the first report of its type produced by the Kapiti Coast District Council. The report presents monitoring information gathered through the Council's and other agencies monitoring procedures. It is one of the ways the Council is able to measure progress towards the objectives stated in the Kapiti Coast District Plan.

The report focuses on ten of the key significant resource management issues identified in the District Plan. It builds on information currently held on environmental indicators such as ecological sites which are included in the District Plan. However as this is the first report produced some of the information presented is baseline only. Where Council has collected information over a longer period of time trend data is provided.

Most of the environmental indicators show that despite recent development and population pressures on the District the environment is in good condition. However, there are some areas where improvements can be made in the way resources and activities are managed to minimise adverse environmental effects.

Coastal Environment

Overall Rating: 😐

- The effects of subdivision and development on the natural character of the coast are being controlled so they don't reduce amenity values.
- Some areas of the coastline are subject to erosion, which threatens coastal properties and services. However whilst coastal management programmes are successfully minimising damage to property and maintaining coastal character, recent storm events have highlighted areas prone to erosion which is a cause of concern.
- Good public access is available to all areas of the beachfront.
- Poor water quality has been recorded at coastal sites near stream and river mouths due to agricultural run-off into streams and sewage and septic tank discharges, which is subsequently discharged to the coast.

Water Supply and Sewage Disposal Services

Overall Rating: 😐

- Rapid development has increased pressure on existing water and waste services.
- Average and peak water consumption decreased in 1997/98 due to Council educational programmes. However, it increased again in the 1998/99 summer due to a drought. Water restrictions were put in place to conserve water.
- Drinking water quality in the District is good and has generally met the New

Zealand drinking water standards since 1995.

- 87% of the District's population is supplied with reticulated sewage disposal and water supply. Those properties, which are not connected, are predominantly in rural areas.

- Odour problems have occurred at the Paraparaumu sewage treatment plant. These will be reduced when the new sludge disposal plant becomes operational early next year.

Heritage and Cultural Values

Overall Rating: 😐 Culturally Significant Sites: ☹

- While many historic features have been lost due to development pressures in Kapiti there are now 81 significant buildings and places and 73 notable trees protected by the Historic Places Trust or the District Plan.

- There are over 150 archaeological sites in Kapiti with high Maori and European historic values.

- There are currently only thirteen identified culturally significant sites in the District. Council is implementing a strategy over the next twelve months to identify and protect over 300 additional sites of significance to iwi.

Open Space and Reserves

Overall Rating: ☺

- The area of open space and reserves has increased by 68% since 1997 and now over 50% of the District's land area is zoned conservation or open space.

- Council manages an extensive network of over 60km of public walkways and 420ha of parks and reserves. This equates to over 10ha of Council administered parks and reserves per 1,000 people. However more walkways with better linkages and pavements should be provided.

- Coastal esplanade reserves protect a significant area of the beachfront in Waikanae up to Peka Peka and at Paraparaumu.

Landscape and Ecology

Overall Rating: ☺

- Kapiti District has over 138 ecological sites, indigenous vegetation and natural habitats covering 62% of the District's land area. The biggest of these areas are the Tararua Ranges and Kapiti Island. Council should ensure that these sites and habitats continue to be protected and maintained through conditions on subdivision, use and development. Provision of native plant guidelines will also assist in maintaining and enhancing these areas. Council should also consider the

provision of incentives such as rates relief, direct grants and the creation and administration of an "Environmental Award" scheme to encourage further planting and protection (eg fencing) of these areas.

- Department of Conservation manages and protects 75% of the District's ecological area.

- Outstanding landscape areas are identified in the District Plan with rules to protect the natural character of these areas from inappropriate development and earthworks.

Natural Hazards

Overall Rating: 😐

- The Kapiti Coast is a particularly flood prone area with major rivers dissecting developed areas.

- Flood and earthquake hazard maps have been developed by both the Wellington Regional Council and the Kapiti Coast District Council for the District and development has been controlled in these areas.

- The Council has responded well to recent civil defence emergencies in the District.

Solid Waste and Hazardous Substances

Overall Rating: 😐

- Waste disposal volumes at Kapiti's two landfills has increased by 23% per capita since 1994. However, the net increase in the waste stream was only 2% due to the large volume of waste being recycled and the increase in greenwaste composting.

- The quantity of material recycled has also increased following the collection of newspapers and start of composting operations at both landfills.

- Monitoring shows that the landfills are having no adverse effects on water quality.

- Kapiti Coast has over 118 potentially contaminated sites. Currently there are no systems in place to assess the level of contamination or remediation requirements of these sites.

Subdivision and Development

Overall Rating: 😐

- Projected population growth in Kapiti means that an additional 200 hectares of residential land will be required in the next 25 years. This development will place pressure on already stretched infrastructure.

- While residential building density in Kapiti is currently low, this is expected to increase over the next 15 years as the demand for residential land continues.

- Several large subdivisions have recently been approved in sensitive areas (coastal environment) and in outstanding landscape areas. Conditions were imposed on development to minimise the impact on the environment and amenity values.

Noise

Overall Rating: 😐

- The number of noise complaints received by the Council has increased by 122% since 1993. Most noise complaints received relate to loud music.

- Council has established 14 noise monitoring sites throughout the District to gather information on background noise levels. Noise levels between 1993 and 1999 have remained relatively constant. Traffic noise is the key cause of higher noise levels in the District.

- All but three residential noise monitoring sites have noise levels lower than the District Plan noise standard. Higher noise levels at the three sites that do not comply with the District Plan standard are caused by traffic noise.

Transport

Overall Rating: 😐

- The total number of accidents on local roads and State Highway One remains steady and is comparable with the national average.

- Public transport use statistics are comparable with the national average.

- Council is continuing to upgrade existing roads and investigate options for reducing congestion on existing roads, including the development of new roads.

Introduction

Kapiti's Environment

The popularity of the Kapiti Coast as a place to live is evident by the significant increase in population and associated development over recent years. In the past 10 years the Kapiti Coast has experienced an average growth rate of 2.8% per annum. This is more than five times that of the average growth rate of the Wellington Region as a whole.

Kapiti Coast's popularity is due in part to its unique environment and relaxed lifestyle. From the expansive coastline and beaches to the Tararua Ranges, Kapiti provides a variety of recreational and commercial opportunities. The Kapiti Coast also has high cultural values and a rich natural and built heritage.

Kapiti's environment has been subject to significant change over a short period of time.

As a result of the rapid development, Kapiti's environment has been subject to significant change over a relatively short period of time. While the growth rate is slowing it is expected that growth will continue over the next twenty to thirty years.

Understanding the effects of development and associated activities on the natural and built environment can only be achieved through the systematic collection of relevant information. Sharing this information in a report such as this allows the wider community to understand the effects of their activities on the environment. This information also allows the Kapiti Coast District Council to understand the effectiveness of its policies in achieving its resource management objectives.

State of environment reporting

Information gathered through monitoring allows us to understand the effects of activities on the environment.

The environment is made up of the natural and physical (man-made) resources that we rely on for our social, cultural and economic wellbeing. Understanding the state of our natural and physical environment is becoming increasingly important, both in New Zealand and overseas.

Information gathered through monitoring the state of our environment is used to help determine the impact that our activities are having on the environment. This allows us to make better decisions regarding the management of our natural and physical resources.

The Resource Management Act also requires councils to monitor the state of the environment to provide a baseline

against which changes in environmental quality can be measured. The Council is committed to undertaking comprehensive ongoing environmental monitoring and regular reporting of the information.

Kapiti's first State of the Environment report presents baseline data which future reports can build on.

This is the first State of the Environment report for the Kapiti Coast District. It presents information on a range of key environmental issues facing the District. As this is the first time that environmental information has been presented in such a complete form, some of the information presented is baseline data only. This means that data can only be presented for one year. Ideally information should be presented for a longer period of time as this enables trends in the quality of resources to be identified (i.e. is the quality of our resources improving or degrading). The areas where only baseline data is available will be built on in subsequent reports. Where possible trends over time have been presented where the Council has collected this information in previous years.

Future State of the Environment reports for Kapiti will enable the identification of more trends in the quality of our environment over time. This will help us assess the impacts of our activities on the environment and how well we are doing at managing the District's natural and physical resources.

Structure of this report

The report presents information on Kapiti's significant resource management issues.

This State of the Environment report deals with the District's significant resource management issues as identified in the proposed Kapiti Coast District Plan. These issues were identified in consultation with the community during the development of the plan and were identified as being important for the Council to manage. They represent those aspects of the environment that the Kapiti Coast District Council has the responsibility to manage under the Resource Management Act 1991.

The issues include:

- *Coastal Environment*
- *Water and Waste Services*
- *Heritage and Cultural Values*
- *Open Space and Reserves*
- *Landscape and Ecology*
- *Natural Hazards*

- *Solid Waste and Hazardous Substances*
- *Noise*
- *Subdivision and Development*
- *Transport*

For each of the issues the report discusses:

- *The Council's objective for managing the resource (derived from the Proposed District Plan)*
- *Activities and their effects on the issue*
- *What we know about the state of the environment as it relates to the issue*
- *Action taken by the Council to manage the key issue*
- *What you can do to help*
- *Contacts for more information*

Monitoring tools used by the Council

Environmental indicators have been used to assist Council to identify information needs.

Environmental indicators have been used to assist the Council in the collection of relevant information. Indicators are sometimes known as parameters, and they define what should be monitored on a regular basis to detect changes in the state of the environment. Indicators can be developed to measure the threat or pressure on the environment, the state of the environment and the response taken by Council or others to protect the environment. This report presents a list of environmental indicators for all of the key issues and reports on the information collected on each indicator.

Where to from here?

Council will continue current monitoring activities to further detect changes in the environment.

Following the production of this report the Council will produce a report outlining the requirements of future monitoring activities. This report will highlight areas where the Council needs to improve and refine its monitoring procedures to better understand progress towards its objectives.

Council's current environmental monitoring activities will continue to enable the comparison of information obtained in subsequent years against the information presented in this report. This will provide an indication of trends in the quality of Kapiti's environmental resources. State of environment reporting in Kapiti will occur on a five yearly basis. For the years in between the Council will produce a District Plan monitoring report on an annual basis, and will continue to

produce targeted monitoring reports on individual issues such as water conservation.

1. Coastal Environment

Objectives for managing the coastal environment

- *To protect and enhance the natural character, natural values and associated amenity values of the coastal environment.*
- *To maintain and enhance public access to the coastal environment for the enjoyment of the community.*

Kapiti's coastal environment

Kapiti has a unique coastal environment with ecological amenity, cultural, recreational and commercial values.

The Kapiti Coast District has over 40 km of coastline, containing important wildlife habitats and breeding grounds for a variety of fish and bird species. The coast and its surrounding landforms are also important recreational and commercial resources, which are highly valued by the community for their natural characteristics and amenity.

The coast also has great cultural and spiritual significance to Maori and is an important source of kaimoana or food.

Where does the coastal environment extend and who is responsible for its protection?

The Wellington Regional Council and the Department of Conservation are responsible for the coastal marine area. The coastal marine area extends from mean high water spring (MHWS) to the edge of the territorial sea which lies 12 nautical miles from the low water mark along the coast and includes the coasts of all islands. The coastal marine area includes the foreshore, seabed and the airspace above the water. It also includes approximately 1km upstream of any river mouth and coastal wetlands such as estuaries and lagoons.

The Kapiti Coast District Council only has responsibility for the area inland of mean high water springs including the sand dunes and associated landforms. This chapter focuses primarily on the environment in this area. However many of the land based activities that the District Council manages can also affect the quality of the coastal marine area, such as discharges of wastewater into the sea. In addition, treated effluent is discharged to surface water that ultimately reaches the sea. The effects of these activities are also discussed.

The effect of activities on the coastal environment

The dune formations inland of the coastline have been under considerable pressure for development as beachfront properties demand high prices in the market. However this environment is particularly sensitive to beach erosion, which in the past has threatened coastal properties. Coastal development increases the susceptibility of the dunes to erosion as the natural formations are disturbed.

The visual impact of buildings on the landscape can detract from the natural character and amenity of the coast. Coastal development can also restrict community access to the coast by reducing the number of public accessways.

Conflicts between uses of the coastal environment need to be managed to protect its quality.

Land-based activities, particularly sewage disposal, septic tanks and run-off from agricultural land and streets in urban areas, can have adverse effects on coastal water quality. Pollution of rivers and streams and increased sedimentation resulting from high rainfall can also be discharged into the coastal environment affecting coastal water quality. Poor water quality in turn can affect the marine plant and fish life and make the beach unsuitable for swimming, shellfish gathering and other recreational activities.

Key issues for the coastal environment

- *Coastal erosion resulting in damage to the natural landscape and to property.*
- *Coastal development impacting on the natural character and values by altering landforms and removing vegetation.*
- *Coastal development reducing public access to the coast.*
- *Land-based and natural activities degrading coastal water quality which can affect recreational and ecological values.*

What we know about the state of the coastal environment

Table 1.1 presents a list of indicators that we can use to monitor the state of the coastal environment. The indicators provide information, which helps us understand our performance in achieving the objectives for the coastal environment and dealing with the key issues described above.

Indicators for the Coastal Environment	
Issue	**Indicator**
Protecting natural character and property	• Rate of coastal erosion and accretion • Area of foreshore under management programme for coastal erosion
Coastal development	• Number and area of new coastal developments or subdivisions
Access to the coast	• Number beach access ways • Area of coast protected through esplanade strips and other covenants.
Effects of land-based activities on coastal water quality	• Coastal water quality

Table 1. 1

Protecting natural character and property

Historically the Kapiti Coast has undergone long term accretion (build up of sand) since about 6500 years ago when sea levels stabilised following the last post glacial. However, during the last century some areas of the coastline have undergone significant periods of erosion placing coastal properties and public facilities such as roads at risk.

Kapiti has undergone long term coastal accretion with isolated occurrences of erosion.

The reason some areas of the coastline continue to accumulate sand and move seaward while others areas are eroded away is complex. It is the result of beach processes such as currents and winds and the effects of Kapiti Island on wave action in the wave zone hitting the foreshore. This is explained further in the case study below.

Coastal erosion:

Beach cross-section surveys at Paraparaumu during the period of 1984 to 1993 showed that the foredune along Marine Parade had been eroding at an average rate of 2 to 3 metres per year.

In the past coastal erosion has threatened beachfront properties.

Net erosion has also occurred over the past century at Raumati and Paekakariki, the extent of which is unknown. Recent monitoring has indicated a reversal from accretion to erosion for the coastline south of the Kapiti Boating Club and the coastline along Queen Elizabeth Park.

Coastal accretion:

Over the last century the coastline between Peka Peka and Te Horo has been moving seaward or accreting at a rate of 0.7metres per year. There has also been net accretion along the coastline between Paraparaumu and Peka Peka.

However while these areas are accreting short term erosion caused by a major storm could still threatened homes and properties that have been built too close to the foreshore.

Beach management and protection:

Timber seawalls have been built in the past to protect property however, Council now favours more natural beach protection options.

Timber seawalls have been generally built to protect public property along much of the coastline at Paekakariki (1.4km in length), Raumati (3.1km in length) and at isolated points along the Paraparaumu coastline. Generally the purpose of the seawalls constructed by Council are to protect public assets, with the exception being along Raumati Beach where seawalls were constructed to protect private property but were funded by the owners. The timber seawalls have successfully stabilised the coastline for almost 20 years.

The Council has had restrictions on development in the coastal environment in place since 1980. A 20 metre wide no building zone exists along most of the Kapiti coastline within the urban areas where new construction is not permitted (in the rural zone this is 100 metres wide). There is also a further 30 metre wide zone where new building is required to be relocatable. The Council now favours other beach management protection options as opposed to seawall structures, which are considered less appropriate. This is because they detract from the natural character of the coast and may lead to lowering of the beach.

More favoured options include beach renourishment of sand to encourage natural accretion of beach and foredunes and alleviate erosion. The following case study is an example of a monitoring and management programme undertaken by the Council in response to the problem of coastal erosion in Paraparaumu.

Case Study: Paraparaumu Beach Renourishment Programme

The Paraparaumu beach renourishment programme was a trial programme undertaken by the Council to assess the usefulness of beach renourishment as a management tool for the protection of coastal public assets (primarily roads such as Marine Parade and associated infrastructure) from coastal erosion.

Kapiti Island creates a shadow of reduced wave energy, resulting in the deposition of sediment along some areas of the Kapiti coastline. This is most pronounced at Paraparaumu where a significant headland has formed. Between 1880 and 1977, the headland at Paraparaumu advanced seaward between 49 and 195 metres, resulting in wider beaches with ample sand.

Paraparaumu Beach at the headland

In contrast however, beach cross-section surveys from 1984 to 1993 showed overall erosion of the foredune along Marine Parade at a significant rate of two to three metres per year. This occurred at the same time the beach along Manly Street accreted.

In 1993, the Kapiti Coast District Council decided to act to protect Marine Parade from being eroded by the sea. To preserve the natural character of the coastline as far as possible, the Council was advised that beach and foredune renourishment was the most appropriate action. It was proposed that a trial be undertaken to test whether a larger-scale renourishment programme would be successful.

The necessary resource consents were applied for to move sand from one section of the beach to the coastline at Marine Parade. The Wellington Regional Council granted consents in September 1994. In November 1994, 6000 m^3 of sand was scraped from the beach fronting Manly Street and deposited against the dune face along a 200-m length of Marine Parade.

Regular monitoring including cross-section surveys was undertaken at both Marine Parade and Manly Street. Sand extraction from the beach at Manly Street was considered to have negligible impact on the character and ecology of the area. Survey monitoring did show, however, that there was some evidence of wind erosion at Manly Street beach, and a dune management programme to reduce such losses was recommended. Further monitoring has shown that since November 1994 when the sand was moved, there has been accretion at all parts of the Paraparaumu headland except at the north end of Manly Street. The trial was considered a success and the Council is further investigating a long-term renourishment programme for this area and other areas of the Kapiti Coast.

Coastal development

Hindsight has shown that in the past development has occurred which may have been too close to the coastline.

The New Zealand Coastal Policy Statement (NZCPS) allows local authorities to provide for subdivision and development in the coastal environment, but the adverse effects of such development must be avoided, remedied or mitigated. Due to the high amenity, character and intrinsic values of the Kapiti coastline, it has been a popular location for coastal subdivision and development. However hindsight has shown that on occasions development has occurred which may have been too close to the coastline.

Figure 1.1 illustrates the area in hectares subdivided in the coastal area from 1992 to 1998.

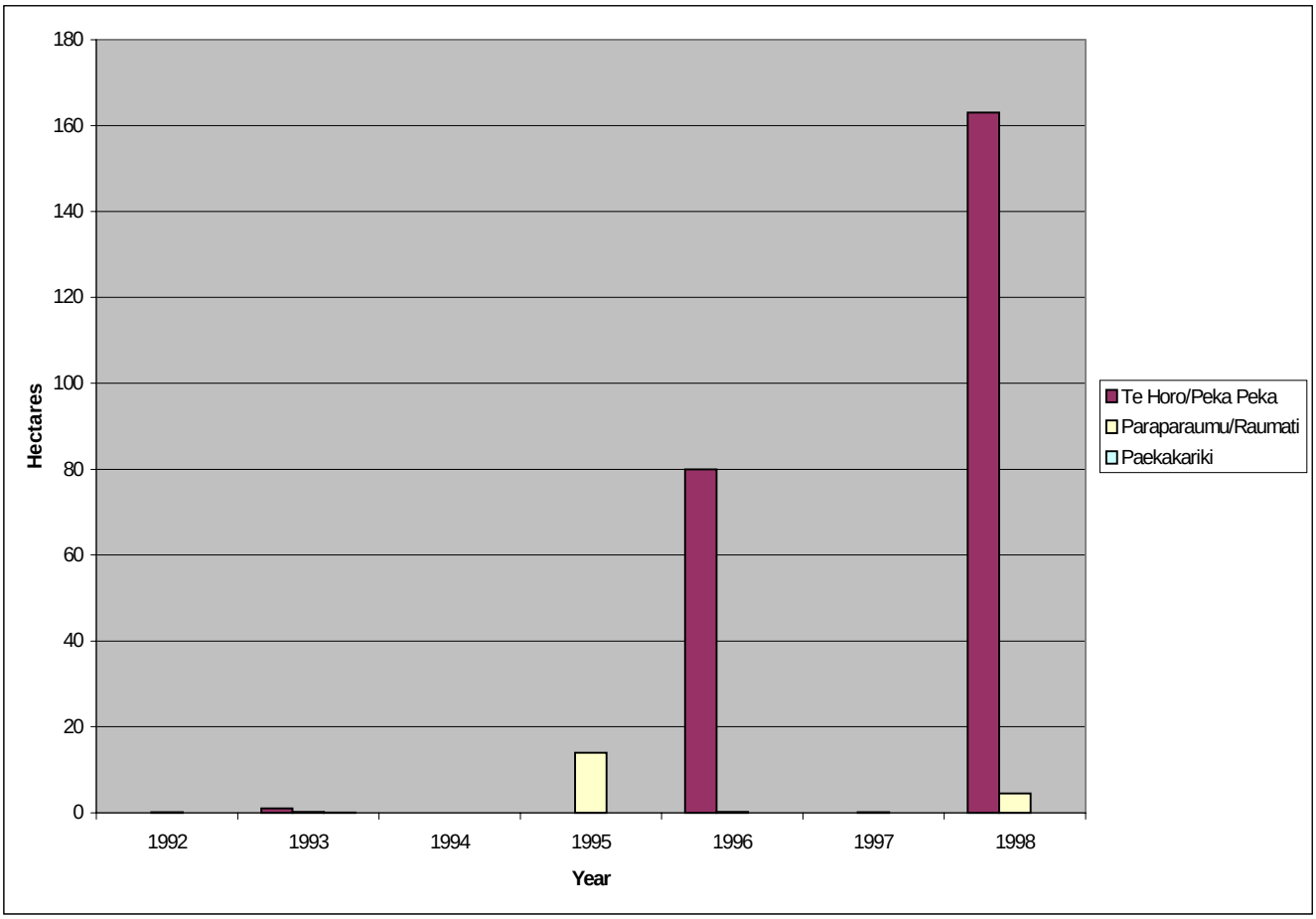

Figure 1.1 Coastal area subdivided 1992 to 1998 (Hectares)

Between 1992 to 1998 there have been 31 subdivision consents including 26 infill consents along the Kapiti Coast beachfront. Most of this development has been in Paraparaumu, Raumati, Te Horo and Peka Peka. There have been no coastal subdivision consents issued for Otaki or Waikanae since 1992.

Subdivision in the coastal area needs to be carefully managed to ensure that character and amenity values are not compromised

Subdivision consents in coastal areas contain conditions, which ensure that the development does not have any adverse effects on the character or natural environment of the coastal area. These include conditions that require buildings to be sited so that they are not visible from the beach, conditions that require buildings to blend in with the coastal environment (for example exterior colours) and power and telecommunication services to be underground including all areas within 500 metres of the beach. There are also stringent controls on earthworks. Continued monitoring will be undertaken to assess the impacts of subdivision on the coastal environment. In practice Council takes a precautionary approach when determining whether or not to approve subdivision that is within 50 metres of the coast.

Access to the coast

Public access to the foreshore along the Kapiti Coast has a history of being a highly valued by the community due to the coastline's high recreational and amenity values. Table 1.2 gives numbers of beach accessways by area.

Table 1.2. Beach accessways.

Area	*Number of accessways*
Paekakariki	4
Paraparaumu/Raumati	26
Waikanae	12
Otaki	1

Along the higher used sections of the Kapiti coastline such as Paraparaumu/Raumati and Waikanae the number of beach access points are 26 and 12 respectively giving good access to all areas of the coast. While Otaki has no formal access ways almost the entire length of the beachfront fronts onto a public road and beach reserve where the public can access the beach.

Effects of land based activities on coastal water quality.

While monitoring coastal water quality is the responsibility of the Wellington Regional Council many land-based activities have the potential to adversely affect coastal water quality. As the Kapiti Coast District Council is responsible for managing these activities, such as development on the coast, the issue of coastal water quality has been briefly included in this report.

Public access to the beach needs to be maintained to ensure everybody can enjoy the coast.

The following summarises the Wellington Regional Council annual water quality monitoring programme for the 1997/98 monitoring period:

- *Poorest water quality in the Kapiti Coast area was reported at sites located near stream or river mouths. This is due to sewage treatment plant discharges, septic tank discharges and agricultural runoff into rivers and streams, which flow into the sea.*
- *Four sites (Mangaone Stream mouth, Tutere Street, MacLean Street, Garden Road) exceeded contact recreation guidelines and one site (Peka Peka Beach) exceeded the shellfish gathering guideline in the Kapiti Coast area.*
- *Some remedial action has occurred in Mangaone Stream. Further investigation at the Peka Peka Beach and Raumati Beach areas is required to determine sources of faecal contamination.*
- *One site (Road End) in Queen Elizabeth Park showed a significant improvement in bacteria levels since 1992 and two sites (William Street and MacLean Street) have deteriorated significantly over that time. The improvement at the Road End site may be due to restriction of stock access to Wainui Stream and a septic tank upgrade in 1994. Reasons for other changes are unclear.*

*For more information on **coastal water quality** contact the **Wellington Regional Council** or look for the Wellington Region Annual Environment Report 1999.*

Summary

Protecting natural character and property		Ongoing monitoring is identifying trends in erosion and accretion. A Beach renourishment programme was successfully implemented at Paraparaumu. Historical seawall protection has been reducing coastal erosion in the past, protecting the majority of the coastline under threat. However, recent erosion at Waikanae, North Beach (Paraparaumu) and Paekakariki is a cause for concern.
Coastal development		Subdivision and landfill consents in the coastal area have been granted in accordance with the District Plan and Coastal Policy Statement.
Access to the coast		Good access is available to well-used areas of the coast.
Effects of land based activities on coastal water quality		Poor water quality is at times recorded along the Kapiti coastline. While discharges to the coastal environment is the role of Wellington Regional Council, the District Council has responsibility for disposal of treated effluent and its effects on water quality.

What council is doing to manage the coastal environment

The Council is working with the community to find suitable solutions to the issue of coastal erosion.

- *Preparing coastal management plans, which state where and how development can occur to protect natural values.*
- *Undertaking annual dune surveys to monitor coastal erosion.*
- *Carrying out monthly inspections of the coast, seawalls, cleaning beach outlets and making repairs where necessary.*
- *Maintaining existing seawall structures.*
- *Developing a coastal process model to determine the coastal hazard and to review the District Plan restrictions on subdivision and development in the coastal environment.*

- *Developing a coastal buffer zone where subdivision and development will not be permitted to protect natural character and reduce the effects of coastal erosion on buildings, land and roads.*
- *Educating the community on coastal erosion and the responsibility of the property owners.*
- *Undertaking beach renourishment and vegetation programmes to enhance the natural character.*
- *Providing beach access ways on council owned land.*

What you can do to help

- *Maintain seawalls and other coastal protection on your property.*
- *Understand your responsibilities as a homeowner to manage coastal erosion on your property.*
- *Volunteer your school or community group to assist the council with coastal planting programmes.*
- *Ensure your septic tank is working properly and not discharging into rivers or the coastal environment.*

Contacts for further information

Stormwater Engineer - Kapiti Coast District Council (04) 904 5751

Wellington Regional Council (04) 384 5708

2. Water Supply and Sewage Disposal Services

Objective for managing Kapiti's water supply and sewage

- *To provide for the efficient development, operation and maintenance of water supply and sewage collection and disposal throughout the District while minimising potentially adverse environmental impacts.*

Kapiti's water supply and sewage

Water supply and sewage disposal are vital services for the Kapiti Coast's economy, residents and environment.

Adequate water supply and sewage disposal are vital services for the Kapiti Coast's industry, residents and environment. Without these services the health and wellbeing of the Kapiti Coast's community is compromised, and the environment can be degraded.

The Tararua mountain range is Kapiti's natural water collection area. Water flowing off the Tararua Range and into the Wainui Stream, Waikanae River, Otaki River and Waitohu River are the main surface water supplies for the District. Groundwater bores from the Otaki and Hautere areas supplement river supply.

Kapiti's rivers have ample flow in winter months but during most summers, flows reduce due to lower rainfall and increased demand.

The District's water supply systems serve one rural area (Hautere/Te Horo) and four urban areas (Otaki, Waikanae, Paraparaumu/Raumati and Paekakariki) and consist of three river intakes (Waitohu, Waikanae Rivers and Wainui Stream), and eight groundwater bores (Hautere, Rangiuru and Tasman Road bore fields and three emergency bores in Waikanae and Paraparaumu)

The systems also consists of:

- *9 treatment plants*
- *14 pumping stations*
- *19 reservoirs*
- *363 Km of water mains and pipes*

Kapiti's sewerage systems serve three communities; Otaki, Waikanae and Paraparaumu/Raumati. The systems consist of:

- *140 pumping stations*
- *oxidation ponds at Otaki and Waikanae*
- *primary treatment plant for Paraparaumu/Raumati with an activated sludge process with nutrient reducing and sludge incineration*
- *254 km of sewer mains*

The sewerage systems minimise environmental pollution by treating sewage prior to its disposal. They also protect public health by safeguarding hygiene and preventing the spread of disease that can result from human contact with raw sewage.

Pressures on the water supply and sewerage systems

Increased development in Kapiti has put pressure on the water supply and sewage disposal systems.

Because of rapid population growth and development of the Kapiti Coast, the water and sewerage systems that were largely constructed during the 1970's and 1980's now struggle to meet the current demand for water supply and sewage disposal. In addition to this the introduction of the new Drinking Water Standards for New Zealand in 1995, means that a higher level of treatment for water supply is now required.

Heightened awareness of environmental effects also requires the maintenance of minimum flows in river systems to safeguard ecological and recreational values. Increased water demand, minimum flow requirements and low river flows during summer can result in restrictions being placed on the use of water. It is during such times that sparing use of water is required.

Sewage disposal is now subjected to higher environmental standards when it is discharged to land, water and the coastal environments. The impacts of sewage discharge on the coastal environment are addressed in Chapter 1. Sewage disposal can also create other environmental effects such as objectionable odour around pumping stations and sewage treatment plants and sewage overflows into waterways. Illegal connections between stormwater pipes to the sewerage systems can result in such overflows during rainfall events when the capacity of the sewerage system is exceeded.

The demand for increased capacity of the water supply and sewerage systems, and higher treatment standards requires a

significant level of capital investment for developing new treatment plants and associated infrastructure.

Key issues for Kapiti's water supply and sewerage systems

- *Population and development pressures result in increased demand for water use and sewage disposal.*
- *Use of water in Kapiti is at times not always used in an efficient manner, and has to be restricted.*
- *Higher environmental standards are now set for drinking water quality and sewage disposal.*
- *Stormwater flow can find its way into sewers decreasing their capacity.*
- *Access to reticulated water supply and sewerage.*

What we know about Kapiti's water supply system

Table 2.1 presents a list of indicators that we can use to monitor Kapiti's water supply and sewerage systems. The indicators provide information that helps us understand our performance in achieving the objectives for the water supply and sewerage systems and dealing with the key issues described above.

Indicators for Water Supply and Sewerage	
Issue	**Indicator**
Increasing water use	• *Volume of water consumed per capita.*
Water availability	• *Number and period of time water restrictions enforced.*
Access to reticulated water supply	• *Percentage and number of dwellings on reticulated water supply system.*
Safe drinking water	• *Quality of drinking water.*
Under capacity of sewer system	• *Number of wet weather overflows.*

Indicators for Water Supply and Sewerage	
Issue	**Indicator**
Environmental effects of sewage disposal	• *Number of odour complaints.*
Access to reticulated sewerage system	• *Percentage and number of dwellings on reticulated sewerage system.*

Table 2. 1

Volume of water consumption

The volume of water used determines whether the current water supply system can meet the needs of the District. For most of the year the system provides more supply than demand, but during dry periods peak water use increases dramatically. Table 2.1 shows both summer peak and average water use per day per person since 1996. This shows that water consumption per person generally declined in the 1997/98 summer, compared with 1996/97. The most dramatic decline was in Waikanae area, which reduced water use by more than one third between 1996/97 and 1997/98. The Council's water conservation and public education programmes which included the leak detection programme are the main reasons for this decline. Average water consumption increased slightly again in 1998/99, while peak consumption remained stable.

Peak and average water consumption per day for 1996/97, 1997/98 and 1998/99 summer (litres/person/day)

Location	1996/97 peak consumption	1996/97 average consumption	1997/98 peak consumption	1997/98 average consumption	1998/99 peak consumption	1998/99 average consumption
Paekakariki	767	483	685	453	623	400
Paraparaumu /Raumati	770	470	676	478	645	449
Waikanae	1349	564	837	548	906	575
Otaki	1236	580	1029	581	1067	688

Table 2. 2

Note: summer period defined as 1 December to 30 April

Water restrictions

Kapiti Coast has 363 km of water mains and provides over 30 million litres of water a day.

During summer months users may want to abstract more water from the system than it can supply. At these times restrictions are necessary. However residents and industry on the Kapiti Coast require a secure supply to ensure that drinking water, health and hygiene and economic activity can continue. Therefore a compromise is reached which restricts water taken for non-essential use (e.g. garden watering). The number of restrictions is determined by the weather (hence river flows and groundwater levels) and water use.

During 1998 and 1999 year round restrictions on use of sprinklers remained in place in Otaki and Paekakariki.

During January 1999 restrictions were placed on the Waikanae, Raumati and Paraparaumu areas. Table 2.2 shows sprinkler and hosing restrictions in these areas were first put in place on 3 January 1999 and by 15 February a complete ban on the use of hoses and sprinklers was in place.

By 7 April the total sprinkler and hosing restrictions were lifted and normal restrictions were returned to.

Dates and levels of restrictions enforced for Waikanae, Paraparaumu and Raumati	
Date enforced/lifted	*Restriction level*
3 January 1999	Sprinkler ban / hosing restriction enforced
18 January 1999	Sprinkler ban / hosing restriction lifted. Return to year round restrictions
26 January 1999	Sprinkler ban / hosing restriction enforced
15 February 1999	Hose ban enforced
22 February 1999	Hose ban lifted. Return to sprinkler ban / hosing restriction
17 March 1999	Hosing Restriction lifted / Sprinkler Ban remains enforced (trial, as normally both bans are lifted at the same time
7 April 1999	Sprinkler Ban lifted. Return to year round restrictions
16 April 1999	All restrictions removed except for sprinkler ban in Paekakariki

Table 2. 3

Number of dwellings with reticulated water supply

Reticulated water is usually the preferred source of supply as it is treated to improve water quality and remove disease-carrying organisms and is generally reliable all year. Table 2.4 compares the number of properties with and without reticulated water supply access in the District.

Properties with Reticulated Water Supply in Kapiti				
Water Supply Area	**Total Properties**	**Properties Connected**	**Properties not connected***	**% not connected**
Otaki	3,954	2,702	1,252	32%
Waikanae	5,429	4,728	701	13%
Paraparaumu / Raumati	9,336	9,031	305	3%
Paekakariki	816	714	102	12%
Total	19,553	17,175	2,360	12%

Table 2. 4

* predominantly rural

The table shows that almost a third of the properties in Otaki are not on reticulated supply, reflecting the large number of properties in the Otaki Ward in the rural zone. Overall, however, 88% of the total properties in the District are on reticulated water supply. The Council has a policy of requiring reticulation of all new subdivisions in the urban areas of the District and the water supply reticulation network has recently been extended to two new areas.

Quality of drinking water

Good quality drinking water is essential for public health, not only in residential homes but also in schools, motels, commercial and industrial premises, hospitals and some industries. The Ministry of Health introduced a new standard for drinking water supplies in 1995. The District's supplies have generally met the requirements, with the exception of:

- *A number of samples for testing taken in part of the Otaki reticulation.*
- *An inability to demonstrate that all particles greater than 5 microns have been removed from Paekakariki's water supply.*

- *The Otaki groundwater system is vulnerable to possible contamination from overlying land uses.*

Stormwater flow into sewers

Illegal connections of stormwater pipes to the sewerage pipe system cause the capacity of the sewerage system to be exceeded during rainfall events and overflows of sewage in waterways. The Council has begun a programme of reducing stormwater flow into the sewer system, which will reduce the pressure on the sewerage system during rainfall events. This involves house to house inspections and is programmed for completion by the end 1999.

Odour Complaints

Wastewater treatment systems and infrastructure create odour during treatment and transport of sewage. At times odour complaints are received from residents living close to sewage treatment plants and pump stations. Complaints are usually received during summer months as odour becomes worse during dry hot weather. The total number of odour complaints for pump stations for all of 1998 up to April 1999 was 18. The total number of odour complaints for 1998 in relation to all sewage treatment plants was also 18. Monitoring of the number of complaints in the future will enable the performance in this area to be assessed.

Number of dwellings on reticulated system

The Council treats and disposes of 8 million litres of wastewater each day

Removal of domestic sewage through a reticulated network and subsequent treatment is a preferred method of sewage disposal as it receives a higher standard of treatment and reduces environmental impacts. The number of dwellings that are connected to the reticulated sewerage system are shown in Table 2.5.

Properties with Reticulated Sewage				
Sewage Area	**Total Properties**	**Properties connected**	**Properties that cannot be connected***	**% not connected**
Otaki	3,782	2,616	1166	31%
Waikanae	5,381	4,647	734	14%
Paraparaumu / Raumati	9,069	8,818	251	3%
Paekakariki	816	-	816	100%

Total	19048	16,081	2,967	16%

Table 2. 5

*predominantly rural

16% of the District's residents are not connected to reticulated sewerage.

Table 2.5 shows the number of properties that are not connected to reticulated sewerage in the District is only 16%. In addition to this almost a third of the properties in Otaki have private sewage disposal to septic tanks. As with reticulated water, this reflects the number of properties in the Otaki Wards that are in the rural area, many of which are lifestyle blocks. The Council has a policy of requiring reticulation of all new subdivisions in the urban areas of the District.

Case Study – The 1998/99 Summer Drought and La Nina Weather Pattern

The 1998/99 summer was influenced by a strong La Nina pattern. This gives mainly easterly winds across the Kapiti Coast, which differs from the predominant north westerly wind pattern. This is different from the 1997/98 summer where the El Nino weather pattern dominated New Zealand's weather. The result of the La Nina climate pattern was warmer temperatures, greater sunshine, and 75% less than normal rainfall for the Kapiti Coast, and the onset of drought conditions very early in December 1998.

The ability to supply water from the District's river intakes was severely limited due to low river flows. During the 1998/99 summer, increased water demand was also occurring with average use per person in the Waikanae, Paraparaumu and Raumati areas approaching 1000 litres per day. This represents more then double the average water use.

At the height of the drought the flow in the Waikanae River dropped significantly while demand remained high. Council prepared to use emergency bores located at Otaihanga Domain and Waikanae Beach to supplement supply. However a week-long total hosing ban saw consumption fall sufficiently to prevent use of the emergency bore supplies.

The Waikanae River intake. Flow is pumped from the river into the Waikanae Water Treatment Plant, to supply Waikanae, Paraparaumu and Raumati. In the background is the Waikanae River flow recording station.

Water Conservation Campaign

The Kapiti Coast Water Conservation Campaign was developed in December 1998, to raise awareness of the need to conserve water supplies during drought and high demand periods. The campaign included:

- *Enforcing water restriction bylaws (hosing and sprinkler restrictions/bans)*
- *Media releases and an advertising campaign*
- *District water watch patrols*
- *Distribution of an information kit to Council staff, councillors and District media*
- *Water tank and groundwater bore promotion for garden watering*
- *Distribution of water conservation brochures and "The Kapiti Water Network" brochure*

By late April the drought was coming to an end and water restrictions were lifted. While the 1998/99 summer was a particularly severe drought in the District, residents responded well to the water conservation campaign and therefore mandatory restrictions were limited to sprinkler bans and hosing restrictions, with only a week long hose ban in place.

Summary

Water consumption		Decreases in water use were experienced during the 1997/98 summer, compared with the previous summer. However, an increase in average consumption was recorded during 1998/99. This was expected, however, due to the significant drought. Water use on the Kapiti Coast remains high compared with other Districts in New Zealand.
Water restrictions		Year round restrictions remain in place for Paekakariki. Restrictions were in place for the summer in Waikanae, Paraparaumu and Raumati due to high demand and low river flows.
Drinking water quality		Drinking water quality has generally met the New Zealand standards since 1995. Other issues affecting the water supply system grading are being addressed during 1999.
Reticulation of water supply and sewage disposal		While the majority of properties in the District have reticulated services, 45% of the Otaki area and all of Paekakariki are without reticulated sewage. 46% of the Otaki area is without reticulated water supply. The rural nature of much of the Otaki area means that this is not inconsistent with many other rural areas in New Zealand.
Odour complaints		Odour problems at the Paraparaumu plant will reduce when the new sludge vitrification plant is operational early next year.
Stormwater overflows		A prevention programme aimed at reducing illegal connections of stormwater into the sewerage system is to be completed by end of the year.

What is the Council doing about water supply and sewage

- Council is due to complete a water supply strategy to ensure the Kapiti Coast has sufficient water for its growing population. This strategy is due for release in February 2000. The Council is also addressing the additional issues affecting their water supply quality rating during 1999 and have committed to continue supplying a high standard of drinking water quality to Kapiti.

- Capacities of sewage treatment plants have recently been reviewed due to the increased pressure on their operation. A $2.3 million tender has been accepted for a new sludge disposal plant for Paraparaumu and has been built. The plant uses an innovative process that turns sewage sludge into a sterile glass like substance. The plant should be fully commissioned by early next year and does not require lagoons for storing sludge. An extra $500,000 has also been set aside to restore the existing lagoons, which have been the source of odour complaints from nearby residents.

- Council carries out continual (daily) water testing / monitoring programme of water in both the reticulation system and in the water treatment plants. This is to ensure compliance with the New Zealand drinking water standards.

What are other organisations doing?

- *Wellington Regional Council records river flows and monitors water quality in all of the major rivers and streams in the Kapiti Coast.*

What you can do to help

- *Conserve water during summer months;*
- *Adhere to hosing and sprinkler bans during droughts.*
- *Make sure that your stormwater pipes are not connected to the sewer main.*

Contacts for further information

Services Engineer – Kapiti Coast District Council (04) 904 5854

3. Heritage and Cultural Values

Objectives for managing Kapiti's heritage and cultural values

- *To identify and protect heritage features of significance to the Kapiti Coast.*
- *To recognise and provide for the relationship of Tangata Whenua with the natural environment.*
- *To take into account the principles of the Treaty of Waitangi when managing the District's resources.*

Kapiti's heritage and cultural values

Kapiti has a rich Maori and European Heritage.

The District's history has left behind a rich physical, cultural and spiritual heritage for both European and Maori. Historic heritage is important to our identity as a community. Knowledge of the past helps us to understand where we have come from and what makes the District special.

What is heritage?
Heritage includes any natural or manmade place, area, building, tree or site that is significant to the people of the District. For example, Maori sacred sites and historic buildings.

The values of Tangata Whenua are particularly important when defining the heritage of Kapiti. The District has a rich Maori history, which has resulted in many heritage features of significance to Maori. Maori have different heritage values and requirements for how these resources should be managed.

The Resource Management Act 1991 also requires the unique relationship of Maori with the environment to be taken into account. It is important that the resource management decision making process enables all groups to be involved so that informed decisions can be made about the value of resources to the community.

The effect of activities on heritage and cultural values

Tangata Whenua historical accounts records that Kupe first sighted the Kapiti Coast a thousand years ago. Maori settlement followed shortly after and many great figures of Maori history have been associated with Kapiti and its islands. Europeans arrived much later in the eighteenth century to hunt seals and whales and harvest flax and timber. Completion of the railway line throughout the District in 1886 saw the rapid development of the District.

Development pressures in Kapiti have meant that much of its heritage has been destroyed

This occupation of land in Kapiti has left a rich legacy of important links with the past. The continued protection of these links will allow future generations to understand the past.

However, rapid development of the coast has meant that many heritage sites have been destroyed or substantially modified. Earthworks and development have particularly affected archaeological sites and waahi tapu (sacred sites).

Key issues for Kapiti's heritage and cultural values

- *Development pressures resulting in inappropriate use and development of heritage sites.*
- *Removal of vegetation and landforms with heritage or cultural value.*
- *Demolition, removal and alteration of the structure of historic buildings.*
- *Recognising the relationship of Maori with the environment and iwi values in resource management.*

What we know about Kapiti's heritage and cultural values

Table 3.1 presents a list of indicators that we can use to monitor Kapiti's heritage and cultural values. The indicators provide information that help us understand our performance in achieving the objectives for the heritage and cultural values and dealing with the key issues described above.

Indicators for Heritage and Cultural Values	
Issue	**Indicator**
Protection of cultural and heritage sites	• *Number of cultural and heritage sites, trees and buildings that have been protected.* • *Number of cultural and heritage sites that have been lost or modified.*
Iwi values	• *Involvement of iwi and consideration of iwi values in resource management decision making.*

Table 3. 1

Protection of cultural and heritage sites

Historic buildings and places

The Historic Places Trust is responsible for maintaining a register of nationally significant historic places and waahi tapu. The New Zealand historic places register identifies 27 items for protection within the Kapiti Coast District.

Kapiti has a total of 81 protected heritage buildings and places

Six of these items are Class I sites or buildings, which means that they are "*places of special or outstanding historical or cultural heritage significance or value*" (Resource Management Act 1991). Class I sites are fully protected and besides from maintenance and repairs they cannot be altered, modified, damaged or destroyed in any way.

The remaining 21 sites on the national heritage register are Class II sites. All of the sites on this national heritage register are also listed in the District Plan Heritage Register. They can only be modified with permission from the Historic Places Trust and the Council. Resource consent must be granted by the Council to do this.

In addition to the historic places register, the Kapiti Coast District Plan protects an additional 54 buildings and structures with historic values. These sites cannot be altered, modified or demolished without resource consent from the Council.

The number of buildings protected in the District has risen considerably since 1994 when only 23 buildings were protected (see table 3.2).

Buildings listed on the Heritage Register			
Location	**1994**	**1995**	**1999**
Otaki	15	36	38
Waikanae	0	10	10
Paraparaumu / Raumati	2	3	4
Paekakariki	4	15	11
Rural	2	15	18
Total	23	79	81

Table 3. 2

The table shows that nearly half of all heritage buildings are located in Otaki. This is due in part to comparatively low development pressure in the area compared with Paraparaumu and Waikanae. It also reflects the age of Otaki and the relatively high proportion of homes that were built more than 50 years ago.

Despite the increase in the total number of sites on the register there have been some significant losses since 1995 when the register was first notified. This includes the loss of four buildings in Paekakariki and two in Otaki

Examples of a building lost from the register was the Rangiatea Anglican Maori Church in Otaki, which burned to the ground in October 1995. This was a disastrous loss to Kapiti's heritage.

Since 1991 only five resource consents have been granted to modify an historic building or feature. All of these related to the relocation of historic buildings or features.

Kapiti's Heritage Trail

The Kapiti Coast has a heritage trail that highlights 27 historic sites and events in the District. The trail was initiated by the Kapiti Historical Society and the Kapiti Coast Promotion Council, and assisted by the Otaki and Waikanae Historical Societies.

The sites include historic battle grounds, sites of Maori villages, historic churches and plaques relating to health camps and the origin of health stamps. The trail can be followed by a system of signs and descriptive plaques and will eventually form part of a nation-wide trail. The trail is however out of date and is being reviewed and will be updated following the results of the heritage strategy.

Archaeological sites

Kapiti has over 150 archaeological sites.

Kapiti has over 150 recorded archaeological sites that have been identified by the Department of Conservation and the New Zealand Archaeological Association. The sites include burial sites, artefacts, pa sites, and sites associated with

traditional cooking.

Sites associated with European history are also important and these include whaling stations, lighthouses etc. The Department of Conservation monitors many archaeological sites throughout the country to determine adverse effects from erosion and other disturbance.

It is illegal to destroy or damage archaeological sites without permission from the Historic Places Trust. Major developments usually require an archaeological assessment to be undertaken prior to any work beginning to assess whether an unknown archaeological site will be affected.

Notable trees

The NZ Arboricultural Association and the Royal NZ Institute of Horticulture carried out a survey of all notable trees in New Zealand between 1980 and 1992. In the Kapiti District seven notable trees were identified. Two of the seven were native trees, one a Norfolk Island Pine which marks the graves of two Maori chiefs, and the others were considered nationally significant due to their age, size or rarity.

Kapiti has seven nationally significant trees, including one that marks the burial site of two Maori Chiefs

In addition to the Notable Tree Register the Kapiti Coast District Plan protects seventy-three other notable trees that the community considers to be significant to the District and therefore worth protecting. This number has increased from only twelve notable trees protected in 1994.

There have however been two losses since the register was developed in 1995. One was a Kowhai tree in Raumati, which was diseased and a danger to pedestrians, and the other a group of Macrocarpa trees at Paraparaumu primary school, which needed to be felled as they were a danger to school children.

Iwi values

The Maori population in the District has increased slowly over the years and Maori now make up 11.4 % of the community (NZ Census of Population and Dwellings 1996, Statistics NZ).

The Resource Management Act requires Council to recognise and provide for the relationship of Maori and their culture and traditions with the natural environment. The Council's District Plan and decision-making process endeavour to recognise the perspectives of tangata whenua regarding natural resources.

Council consulted with iwi during the development of the District Plan. Local iwi representatives are notified of all major resource consent applications in the District and are able to present a submission to the Council on how the proposed activities may impact on cultural values. Council also requires developers/subdividers to consult directly with iwi where there are likely to be issues of significance that will need to be addressed.

In 1998 iwi were invited to be involved in all publicly notified resource consent applications. Of the 35 publicly notified applications since January 1997, submissions relating to iwi values have been received on 19 applications (54%). Iwi have also commented on 132 non-notified resource consent applications since January 1997.

Waahi tapu

A new heritage strategy will identify and protect over 300 sites of significance to Maori

There are currently only thirteen culturally significant sites identified within the proposed District Plan. There is also a waahi tapu area which is identified in the Proposed District Plan. While the number of identified culturally significant sites has increased since 1994 this number is still low. Many unrecorded sites are not known and are therefore not protected from inadvertent destruction. There has also been a lack of education about those places. Consultation with iwi and the Council is required before any development activity can be undertaken on or near these sites.

Council has acknowledged the need to greater recognise sites of significance to Maori and has been consulting with the three local iwi—Ngati Raukawa, Ngati Toa and Te Ati Awa ki Whakarongotai. Over the next twelve months the Council in consultation and in partnership with the Tangata Whenua will implement a heritage strategy to register and protect sites of significance to iwi. Once registered, any disturbance or removal of these sites will at the very least require consultation with iwi and a resource consent to carry out any work.

Summary

Historic Buildings and Places	☺	While many historic sites were lost as a result of development pressures in Kapiti prior to formal protection, the Historic Places Trust register and the District Plan heritage register now protect a total of 81 significant buildings and places. Also protected are 12 geological sites. There have only been a small percentage of losses or modifications since the register was notified in 1995.
Archaeological Sites	☺	Kapiti has over 150 archaeological sites associated with both European and Maori history. The Historic Places Act and protocols for earthworks protect these.
Notable Trees	☺	There are seven notable trees in the Kapiti District listed on the national notable tree register. An additional 73 trees in the District are protected by the District Plan. This has increased since 1994 when only 12 trees in the District were protected. Only two trees have been lost from the register.
Culturally Significant Sites	☹	There are currently only thirteen identified culturally significant sites in the Kapiti District. However the Council is implementing a strategy over the next 12 months to identify sites of significance to iwi.

What Council is doing to manage Kapiti's heritage and cultural values

- *Maintaining a register to protect significant buildings, sites, places and trees.*
- *Within the next year Council will be writing a policy document to determine non-regulatory assistance to encourage heritage protection, including rates relief and direct grants.*
- *Council is implementing a heritage strategy to protect sites of significance to iwi.*
- *Recognising the importance of iwi values in decision making by consulting with local iwi on major resource management issues.*

What you can do to help

- *Find out what is on the District Plan heritage register that may be on your property.*

- *Contact the Council before you alter, disturb or demolish a listed heritage building, site, area or tree.*
- *Have an Archaeological assessment done before undertaking any major development on a site.*

Contacts for further information

District Planner — Kapiti Coast District Council (04) 904 5828

Historic Places Trust — Wellington (04) 472 4341

4. Open Space and Reserves

Objectives for managing open space and reserves

- *Identify, maintain and enhance the open space and recreation resources of the District to ensure that the present and future needs of the District are met without adverse effects on the environment.*
- *To ensure the preservation of the natural environment of the margins of waterbodies and the enhancement of public access to the margins of those waterbodies through the provision of esplanade reserves, esplanade strips and access strips.*
- *To recognise that Queen Elizabeth Park provides for outdoor recreational use, while protecting a representative example of the natural landscape of the Kapiti Coast Plain.*

Kapiti's open space and reserves

Open spaces and reserves are a vital part of the Kapiti Coast. They are important recreational resources for both passive and active recreation. Open spaces and reserves also have local or ecological values, and provide public access to rivers and the coastal environment.

The Council manages reserves and open space with scenic, recreational, ecological and scientific values

Use of the District's open space and reserves is increasing. Demand for space for informal recreation is increasing, faster than the demand for open space for formal sporting activities. However, the demand for the development for both informal and facilitated recreational reserves continues with the growth in population.

The Reserves Act requires Kapiti Coast District Council to list and maintain land as reserves for a specific function, for example local purpose reserve, recreation, cemetery etc. Conservation land, administered by the Department of Conservation, is managed under the Conservation Act 1987.

The effect of activities on open space and reserves

Open spaces and reserves are under threat from subdivision and development. The Coast's high population growth rate places pressure on the existing reserves, both in terms of increased usage, and in terms of the demand for land for development. There is also a lack of funds available to develop reserves to the community's expectation, due to the exemption in the Transitional District Plan from reserve contributions for infill subdivision and other spending priorities of the Council. This is expected to change with the Proposed District Plan becoming operative, which will generate more funding.

Conflicts can occur between different users of open space and reserves.

Some open spaces and reserves protect ecologically sensitive areas. The use of these reserves for active recreation, for example trail biking in the coastal foredune area, can have significant adverse effects. As use of the open space and reserves increases there is also conflict between different users, for example walkers and mountain bikers.

Development of reserves and open space carries a cost to the community, both to developers as reserve contributions and to the general community through maintenance costs.

Provision of open space and reserves has positive environmental effects as well, such as provision of recreational opportunities that can help to improve health and well being, and lead to an increased appreciation for the natural environment.

Key issues for Kapiti's open space and reserves

- *Increasing community usage of existing reserves and demand for new reserves for a wide range of recreational activities is increasing demands on existing funding.*
- *Loss of open space and adverse effects on associated scenic, ecological and scientific values through subdivision and development.*
- *Access to the margins of waterbodies through the provision of reserves.*

What we know about Kapiti's open space and reserves

Table 4.1 presents a list of indicators we can use to monitor the state of open spaces and reserves and their effectiveness in preserving the natural environment and providing for recreational activities. The indicators provide information, which helps us understand our performance in achieving the objectives for managing open spaces and reserves and dealing with the key issues described above.

Indicators for Open Space and Reserves	
Issue	**Indicator**
Identify, maintain and enhance open space and recreation resources.	• *Area of open space and reserves.* • *Area and location of public walkways.*
Loss of open space through subdivision and development.	• *Rezoning of land to Open Space.*
Access to the margins of waterbodies through the provision of reserves.	• *Location of esplanade reserve, esplanade strips and access strips.*

Table 4. 1

Open space and recreation resources

Area of open space and reserves

Over half of the District is zoned as Conservation and Open Space (50.29%). The Conservation zone includes the Tararua Forest Park and other reserves managed by the Department of Conservation (DoC). Limited development is allowed in this zone, for example construction of huts or access roads. Council also permits limited areas of plantation forestry, where appropriate (*refer to Chapter 5 – Natural Environment for more information about ecological sites and outstanding landscapes).*

In 1997, Council administered 290 hectares of open space land and reserves

The Open Space zone covers 1,587 hectares, and includes areas of significant scenic, ecological, scientific or national importance. It also includes all local purposes reserves administered by the Council. Opportunities for development in this zone are limited by the District Plan. New dwellings, industrial, commercial or farming development are not

permitted.

The Open Space zone includes privately owned land (for example the golf courses), and Queen Elizabeth Park (638ha), which is managed as a regional park by Wellington Regional Council. The remainder of the zone includes land managed by Council as recreation, local purpose and scenic reserves.

In 1997, Council administered some 290 hectares of reserves, and 116 reserves.

Location and area of reserves (1997)		
Location	**Number**	**Area (hectares)**
Otaki	30	61.54
Waikanae	35	120.09
Paraparaumu	32	90.80
Raumati	15	13.21
Paekakariki	4	4.45
Total	116	290.09

Table 4. 2

Since 1997, the area managed by Council has increased by 69%, from 290.09 ha to 420.6 ha, through reserve contributions from subdivisions and changes in reserve ownership. The figure of 420 ha includes anticipated ownership changes for some reserves.

Council is actively seeking to provide increased reserves and open space to provide for increased demand for recreational activities, and the projected population increase over the next 5-25 years.

Changes in reserve ownership

The Department of Conservation manages a number of reserves on the Kapiti Coast. While the land is currently

vested in the Crown, the reserves are actually local purpose reserves. The reason for this is historical. When the reserves were originally created as domains, vesting with the Crown was required. Now, however, ownership of these reserves can rest with the local authority. Council is proceeding with changes in ownership of reserves previously classified as domains, and managed by the Department of Conservation. As a result the area of land for reserves is increasing.

Location and area of reserves (1999)	
URBAN	**Hectares**
Otaki	26.6
Waikanae	114.5
Paraparaumu	89.0
Raumati	17.6
Paekakariki	13.5
Total	**261.2ha**
RURAL	
Otaki	11.0
Te Horo	23.9
Peka Peka	10.4
Reikorangi	26.8
Paraparaumu	17.0
Raumati	64.2
Paekakariki	6.1
Total	**159.4**
GRAND TOTAL	**420.6**

Table 4. 3

Public walkways

There are approximately 60 km of public walkway.

There are approximately 60 kilometres of public walkways through the District. This does not include walkways administered by the Department of Conservation in the Tararua Ranges and on Kapiti Island. The majority of the walkways are located within the main urban areas of Paekakariki, Paraparaumu/Raumati, Waikanae and Otaki. The walkway lengths are approximate as most walkways are interlinked, therefore it is unclear where one walkway ends and another begins. More work is required to create a

network of walkways linking Paekakariki with the northern areas of the District. The existing "informal" walkways along stormwater easements in predominantly urban areas should also be upgraded including sign posting, improved paving and promotion (pamphlets etc).

Council has recently negotiated access agreements with a private landowner in the Waikanae area, for the Waikanae River walkway. As a result, it is now possible to walk along the bank of the Waikanae River from State Highway 1 to the sea, a distance of approximately six kilometres.

Location and Length of Public Walkways	
Paekakariki	10.2 km
Paraparaumu/Raumati	32.2 km
Waikanae	19.5 km
Otaki	6.3 km
TOTAL	**68.2km ***

Table 4. 4

* This does not include walkways administered by the Department of Conservation in the Tararua Ranges and on Kapiti Island.

Effect of subdivision and development on open space

Subdivision and development are placing pressure on existing open space and reserves, by reducing the amount of land available or increasing the number of users. However, on the Kapiti Coast, the amount of open space and reserves is increasing as a result of subdivision and development. This is because the Council requires a reserve contribution (either cash, a percentage of total land value or land), to be provided to the council when land is subdivided. When cash is provided, this is to be used to maintain and develop reserves. The amount of reserves has also increased with the creation of more esplanade reserves, predominantly in the rural areas of the District.

As part of the development of the Proposed District Plan, Council changed the reserve contribution requirements. In the past there was a standard reserves contribution of 7.5% of the land value being subdivided. The changes mean separate contributions for esplanade reserves/strips and recreation and open spaces reserves are now required. As a result, Council will be entitled to more contributions for reserve for recreation, open space or ecological purposes.

The increase in the amount of reserve land, from 290 hectares in 1997 to 420 hectares in 1999, is due in part to increased reserve contributions from development around the District and to changes to the Open Space zone as a result of submissions to the District Plan.

The area of land zoned as Open Space increased by 51.4 hectares as a result of submissions to the District Plan. A significant reserve was gifted to Council as a result of a 64ha subdivision on the Raumati Escarpment.

Access to the margins of waterbodies

Esplanade reserves, strips and access strips

The Resource Management Act 1991 requires local authorities to take land for esplanade reserve, esplanade strip or access strip purposes when land is subdivided.

What are esplanade reserves, esplanade strips and access strips?

An esplanade reserve or strip may be created for the following purpose when land is subdivided;

- Contribution to protection of conservation values.
- Enabling public access to any river, lake or sea.
- Enabling public recreational use of the esplanade reserve or reserve strip and adjacent river, lake or sea.

The location of esplanade strips changes with the location of a riverbank, lake edge or mean high water springs. This ensures that a constant strip is retained for the purpose it was created for, for example, if a 20m esplanade strip is created along a river bank, and the bank erodes, some of the adjoining land will be taken so the esplanade strip remains 20 metres wide.

Kapiti Coast District Council manages some 27,930 square metres of esplanade reserves and strips, most of which are located on the coast, at Paekakariki, Paraparaumu and Waikanae, Peka Peka, Te Horo Beach and Otaki. The esplanade reserve at Waikanae covers approximately 95% of the beach front, while the reserve at Paraparaumu, Peka Peka and Te Horo Beach and Otaki cover 35%, 100% and 60% respectively.

Summary

Open Space and Reserves		The area of open space and reserves has increased by 68% since 1997. Two thirds of the reserves are located in the urban areas. Council manages an extensive network of public walkways throughout the District, which link the major urban centres. Council is increasing the length of walkways through agreements with private landowners where appropriate. More walkways with better linkages and pavements, signage and promotion should be provided.
Effect of subdivision and development		Subdivision and development has contributed to more open space and reserves in Kapiti as a result of Councils reserve contribution and esplanade reserve requirements.
Access to margins of waterbodies		Kapiti Coast District Council manages 27,930 m^2 of coastal esplanade reserves. 95% of the length of the beachfront at Waikanae is protected, while a significant part of the Otaki and Paraparaumu beachfronts are also protected.

What is Council doing to manage open space and reserves

- *Updating the Kapiti Coast Leisure Plan to recognise changes in population projections and increases in Council administered reserves.*
- *Continuing to take reserves contributions from new subdivisions for vesting as recreation reserves, where appropriate.*
- *Increased the reserve contribution in the Proposed District Plan from that in the Transitional District Plan.*
- *Reaching agreement with private landowners to provide access to reserves and extend walking tracks.*
- *Preparing Reserve Management Plans for significant areas of open space.*

Contacts for further information

Parks and Recreation Department – Kapiti Coast District Council

5. Landscape and Ecology

Objectives for managing Kapiti's landscape and ecology

- *That the District's outstanding landscapes are identified and protected from the adverse environmental effects of subdivision, use and development.*
- *To protect and enhance the natural environment and ecological integrity of the District, including protection of significant indigenous vegetation and habitats for indigenous flora and fauna.*

Kapiti's landscape and ecological values

Kapiti has a variety of landscapes, which give it a distinct character.

The Kapiti District has a variety of landscapes ranging from the rugged coastline and offshore islands through to the Tararua Ranges, all of which contribute to the distinct character of the area.

The landscape reflects the interaction of natural and human processes. It is a combination of the natural features of geology, flora and fauna, and the physical results of human activity and land use. Landscapes are an important source of community and personal identity for all cultures and are particularly important to Maori where iwi identity is embodied in the landscape.

The Resource Management Act 1991 requires Council's to protect outstanding landscapes from inappropriate subdivision or development to retain their natural character.

What is an outstanding landscape?
An outstanding landscape is an area or feature that is highly valued by people for its inherent qualities and and which contributes to the identity or character of the natural environment of the District. For example, Kapiti Island, the Otaki and Waikanae River landscapes and the foothills of the Tararua Ranges are identified in the District Plan as outstanding landscapes.

The Act also requires that the natural environment, in particular, the indigenous flora and fauna, are managed in a

sustainable way. In other words, the effects of human activity need to be controlled to protect the natural environment and its ecological processes.

What is ecology?
Ecology is a collective term for plants and animals (flora and fauna) and the places they live (habitats). It also includes the processes that sustain them and keep them healthy, such as water, soils, food and sunlight. For example the natural ecology of the Kapiti District includes areas of wetland, sand dunes, native forest and the coast.

The effect of activities on Kapiti's landscape and ecology

Development pressures on the Kapiti District have led to the substantial removal of indigenous vegetation.

Prior to European settlement last century, the natural land cover of the Kapiti District was indigenous forest, sand dunes and wetland ecosystems. The European settlers harvested the forest trees and wetland flax in the process of clearing the land for farming. Much of the wetland area on the flat land was drained and later sand dunes were flattened to create flat land for houses.

Today, very little of the indigenous land cover remains on the flat plains of the District. The remnants that do exist tend to be isolated and are not linked to important habitat corridors such as the Waikanae River.

The natural environment of the District continues to be modified by human activity and land use practices. Earthworks, vegetation removal and drainage of wetlands to provide land for development, has particularly affected the natural environment and its associated landscapes.

Key issues for Kapiti's landscape and ecology

Development pressures are resulting in :

- *Inappropriate subdivision, use and development of outstanding landscapes.*
- *Location of roads, buildings or structures within outstanding landscapes affecting their character and quality.*
- *Removal of indigenous vegetation and links between habitat corridors.*

What we know about Kapiti's landscape and ecology

Table 5.1 presents a list of indicators that we can use to monitor Kapiti's outstanding landscapes and ecology. The indicators provide information that helps us understand our performance in achieving the objectives for landscape and ecology in dealing with the key issues described above. Over time the percentage of change for each of these indicators, will provide information on trends in the protection and damage of outstanding landscape and ecological areas.

Indicators for Landscape and Ecology	
Issue	**Indicator**
Protection of ecological values	• *Area, type and location of indigenous vegetation identified.* • *Area, type and location of indigenous vegetation protected by reserves, covenants or District Plan rules.* • *Area, location and distribution of habitat corridors.*
Outstanding landscapes	• *Area, type, and location of outstanding landscape features identified.* • *Area, type, and location of outstanding landscape features protected by reserves, covenants or District Plan rules.* • *Area of identified outstanding landscape that has been altered or disturbed by earthworks or development.* • *Number of subdivisions, earthworks and building consents granted in outstanding landscape areas.*

Table 5. 1

Protection of ecological values

Native Vegetation

The land cover of the Kapiti District is predominantly pastoral on the flat plains with indigenous forest on the hills.

Land cover in the Kapiti District includes urban and residential areas, rural pasture, horticulture, plantation forestry and indigenous forest. The flat, more easily developed areas are predominantly urban and pastoral and the less accessible, steep slopes are mostly untended and remain covered in indigenous forest.

Just over 50% of the District's land cover is indigenous forest. Most of this is located in the Tararua Ranges and is protected by a reserve managed by the Department of Conservation.

Native vegetation is protected by rules in the District Plan, which require a resource consent to destroy, burn, cut or remove native vegetation. This rule covers any native vegetation, which forms part of the canopy, or is over 4 metres in height or where it forms part of an area of vegetation of 100m^2 or more. Some individual native trees are also listed as notable trees in the Heritage Register of the District Plan. (Refer to Notable Trees in Heritage section).

Natural Habitat Corridors

Modification of the indigenous land cover is particularly critical where it affects natural habitat corridors. A habitat corridor is a continuous area of vegetation, often associated with a water body (stream, river or coastline) that provides food and cover for wildlife and links to other natural areas. The corridor formed by the Waikanae River is important for birds travelling between Kapiti Island and the mainland on their way to the Tararua Ranges.

The Waikanae River Estuary acts as an important habitat corridor, linking Kapiti Island with the Tararua Ranges.

The sea between Kapiti Island and the mainland is protected by the Kapiti Marine Reserve and provides an important link to the Waikanae River corridor and the Tararua Ranges.

The photo below shows a section of the Waikanae River that has predominantly exotic (not native) vegetation along its banks. It would be more effective as a habitat corridor if more native species were planted.

[insert photo of Waikanae River]

Ecological Sites

The Kapiti District has a number of areas of significant indigenous vegetation and significant habitats of indigenous

species. The District Plan lists 138 ecological sites, the largest of which are on public land and many smaller sites on private land.

Kapiti has a total of 138 ecological sites listed in the District Plan.

Figures 5.3 (a) and (b) show the location and area of each ecological site by ownership or land management agency.

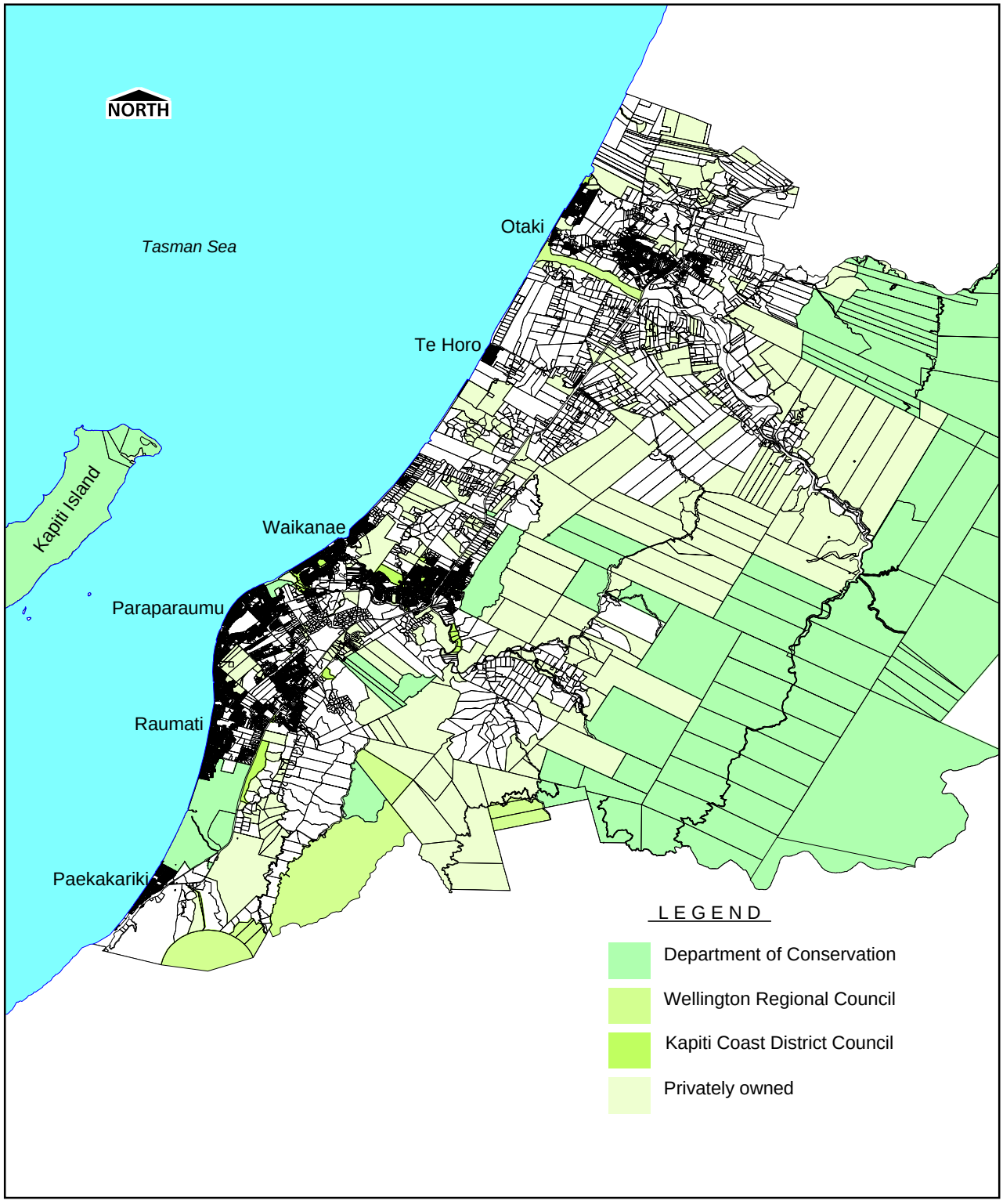

Figure 5.3 (b): Property ownership covering ecological and conservation areas

This Figure shows that the two largest ecological sites are Kapiti Island and the Tararua Ranges. These are both managed by the Department of Conservation and together make up a large proportion of the total area of ecological sites. Ecological sites make up approximately 62% of the total area of the Kapiti District.

The largest area of native bush in the District is the Tararua Ranges.

All ecological sites, including those on private land are listed in the Heritage Register of the District Plan. Rules in the Plan control the removal of native vegetation in these areas. Those ecological sites on public land are also protected by reserves and managed for conservation or other purposes under the Reserves Act.

The pie chart below summarises the ownership or public agencies that manage the ecological sites. It shows that while most of the sites are in private ownership (109 out of a total of 138 sites are on private land), they make up only a small proportion (about one third) of the total area of ecological sites.

Figure 5.4. Ownership of ecological sites

Protection of outstanding landscapes

The outstanding landscapes of the Kapiti District have been identified from a landscape assessment of the District and public consultation.

The District Plan identifies the following outstanding landscapes in the Kapiti District :

- *The foredune and consolidated sand dunes.*
- *The foothills of the Tararua Ranges including Pukehou hill.*
- *The wavecut escarpments behind Paraparaumu, Paekakariki and north of Waikanae.*
- *Kapiti Island and surrounding islands.*
- *The river landscape of the Otaki and Waikanae Rivers.*

Kapiti's outstanding landscapes are shown on Figure 5.5.

Outstanding landscapes on public land (managed by DoC, WRC or KCDC) are protected as reserves under the Reserves Act. All other outstanding landscapes are protected by rules in the District Plan which require resource consents for earthworks, subdivision or forestry in these areas and the undergrounding of all power and telecommunication services.

Thirty-seven consents have been granted in outstanding landscape areas (excluding the coastal area) since 1992 for subdivision (17), earthworks (16) and forestry harvesting or

planting (8). When these figures are combined with a further 52 consents for subdivision in the coastal area, the total consents granted in outstanding landscape areas is 89.

Conditions are placed on consents relating to the location, design and materials of new buildings, structures, services and earthworks to ensure they are not visually dominant. However, an assessment of the combined effect of these developments on the outstanding landscape area is not available.

See also sections on Open Space, Coastal Environment and Heritage (Notable Trees).

Summary

Outstanding Landscapes		While much of Kapiti's indigenous landscape has been modified as a result of development pressures, outstanding landscape areas have been identified in the District Plan. Development controls are placed on earthworks, subdivision, undergrounding of services and siting of structures in these areas. There have been 37 consents granted (plus 52 in the coastal area) for development in outstanding landscape areas since 1992.
Ecology		Kapiti has over 138 ecological sites of significant indigenous vegetation and habitats with controls on vegetation removal. Council should ensure that these sites and habitats continue to be protected and maintained through conditions on subdivision, use and development. Provision of native plant guidelines will also assist in maintaining and enhancing these areas. Council should also consider the provision of incentives such as rates relief, direct grants and the creation and administration of an "Environmental Award" scheme to encourage further planting and protection (eg fencing) of these areas.

What Council is doing to manage Kapiti's outstanding landscapes and ecology

- *Controlling the effects of subdivision, earthworks and location of buildings within outstanding landscape areas through provisions in the District Plan and conditions on subdivision and land use consents.*

- *Controlling the removal of native vegetation on ecological sites and all other significant native vegetation in the rural area.*
- *Released a native plant guideline for lifestyle block owners and new home builders/owners to encourage planting of native species in the rural and urban areas.*
- *Developing guidelines for the location of buildings and control of earthworks in the rural area.*
- *Developing environmental strategies for the Otaki and Waikanae Rivers, which includes a recommendation to provide free native seedlings and planting advice for landholders within the habitat corridor.*

What are other organisations doing?

- *The Department of Conservation manages and protects over 50% of the Districts outstanding landscape and ecological areas.*

What you can do to help

- *Find out what is on the District Plan heritage register list of ecological sites that may be on your property.*
- *Contact the council before you destroy, burn, cut or remove any native vegetation.*
- *Plant indigenous native plants on your property to increase the native habitat of the District using Council's guidelines.*
- *Remove any noxious weeds and pests from your property—contact the Wellington Regional Council to find out how best to remove pests and weeds.*
- *Have an environmental assessment done and seek landscape advice before undertaking any major development or building on a site.*

Contacts for further information

- *District Planner – Kapiti Coast District Council (04) 904 5828*
- *Department of Conservation, Wellington Conservancy (04) 472 5821*
- *Wellington Regional Council (04) 384 5708*
- *Royal Forest and Bird Protection Society of NZ Inc. (04) 385 7374*

6. Natural Hazards

Objective for managing natural hazards:

- *To manage activities and development within natural hazard-prone areas to avoid or mitigate the adverse effects of natural hazards.*

Natural hazards affecting Kapiti

Kapiti is susceptible to a range of natural hazards, the most significant being flooding and earthquakes.

Natural hazards can occur with little warning and cause significant damage to property and the environment and put lives at risk. Kapiti is susceptible to a range of natural hazards including:

- *Flooding*
- *Earthquakes*
- *Storms*
- *Tsunami*

Flooding is the most significant natural hazard that affects the Kapiti Coast as the District has four major river systems that flow through populated areas. These four systems (Waitohu, Otaki, Mangaone and Waikanae Rivers) have headwaters in the Tararua Ranges where high intensity rainfall can occur. Due to the steep catchments this rainfall quickly finds its way into river channels and can lead to flash flooding in the lower catchments.

Earthquakes also affect Kapiti and are potentially more devastating as they occur without warning. The affects of earthquakes on the Kapiti Coast include strong ground shaking, liquefaction (subsidence of silty and sandy sediments) and slips.

The Ohariu Fault is one of four major active faults in the Wellington Region and is a major potential earthquake source. The Kakaho splinter fault off the main Ohariu Fault extends to about five kilometres northeast of Waikanae to Porirua. This section last moved 1100 to 1200 years ago and resulted in a 2.9 metre horizontal and 0.9 metre vertical shift in ground across the fault.

Tsunami are waves generated by offshore. They have a very low risk of occurrence along the Kapiti Coast, more generally affecting the east coast of New Zealand.

What are the effects of natural hazards?

Natural hazards are only a concern if they have the potential to affect people or property. For example, if a river system floods land that is not used or populated, then the flood is simply a natural event rather than a natural hazard. Increased development on the Kapiti Coast has increased the hazard associated with natural events that affect the District.

Increased development in Kapiti can result in increased hazard and hence greater risks from natural events.

While natural events such as floods and earthquakes cannot be prevented from occurring, their effects can be minimised by preventing and controlling development in the most hazard-prone areas. Where development occurs in hazard-prone areas, the effects of natural hazards can be mitigated by engineering works such as construction of stop banks or strengthening of buildings. A crucial role for the Council in areas affected by natural hazards is raising public awareness and ensuring that the public are prepared for emergencies, to reduce the risk to lives and property.

Key issues for Kapiti's natural hazards

- *Increased development creates additional hazard prone areas increasing the risk to lives and property*

What we know about Kapiti's natural hazards

Table 6.1 presents a list of indicators that we can use to monitor Kapiti's natural hazards. The indicators provide information that helps us understand our performance in achieving the objectives of managing natural hazards and dealing with the key issues described above.

Indicators for natural hazards	
Issue	**Indicator**
Frequency and severity of natural hazard events	• *Number of floods.* • *Number of earthquakes.*
Increased development in hazard prone areas	• *Number of properties in the 1% flood zone.* • *Number of properties in the earthquake zone.*

Table 6. 1

Number of floods

Wellington Regional Council keeps river flow records for the Otaki, Waikanae and Waitohu Rivers. This information can be used to monitor flood activity on the Kapiti Coast. Figure 6.1 (a), (b) and (c) illustrate the number of floods greater than the two-year return period flood (i.e. with a 50% chance of occurring each year). Each figure presents flood data available for the rivers since records began. The height of each bar represents the severity of the flood.

Figure 6.1 shows that the largest flood for each river since records began occurred during October 1998 (see case study below). Figure 6.1 also shows that there have been five floods greater than the two-year return period flood recorded in the 1990s in the Otaki and Waikanae Rivers, whereas the Waitohu Stream has had three floods greater than the two-year return period threshold since records began in late 1994.

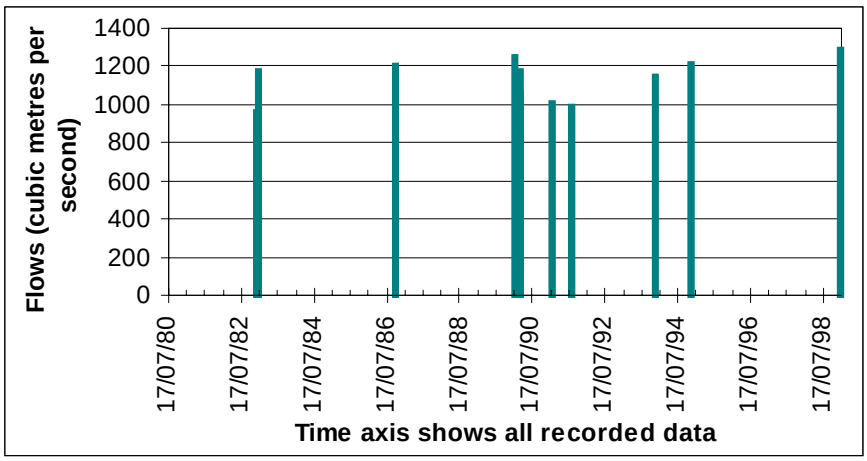

Figure 6.1(a). Otaki River at Pukehinau; flows greater than the two-year flood (938 cumecs).

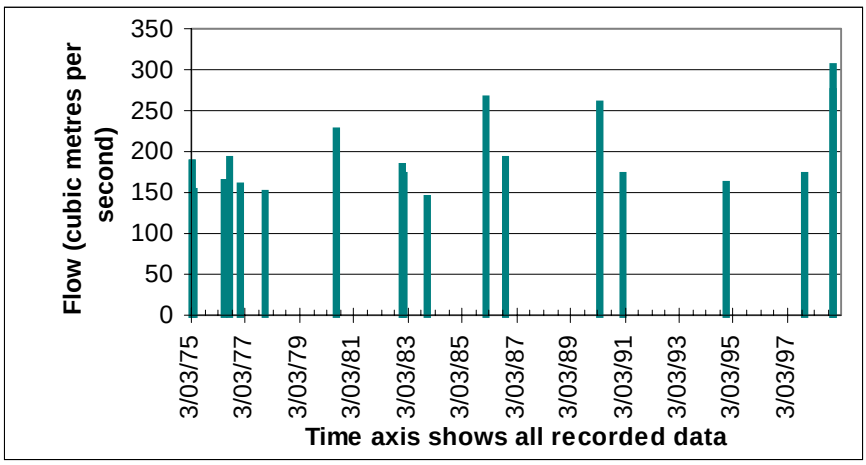

Figure 6.1(b). Waikanae River at Water Treatment Plant; flows greater than the two-year flood (140 cumecs)

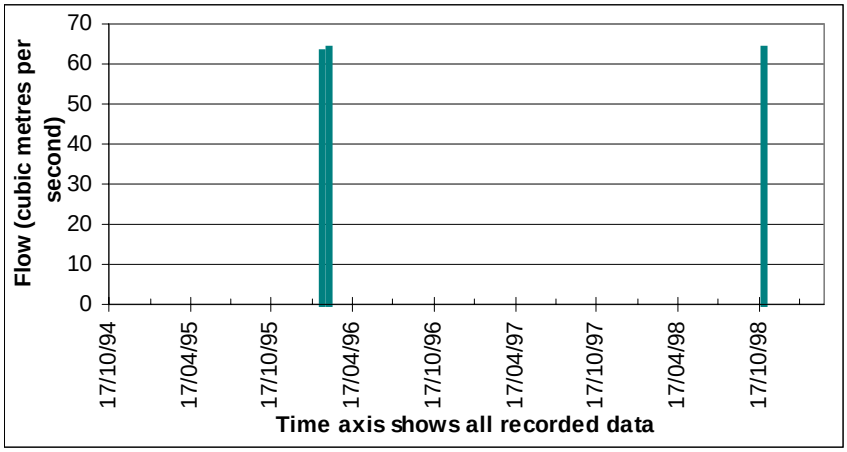

Figure 6.1(c) Waitohu River flows greater than the two-year flood (45 cumecs

Case study: Two states of emergency in one month — The October 1998 floods

The Kapiti Coast experienced two successive floods in October 1998, both resulting in the declaration of a state of emergency by Civil Defence. The first flood occurred from 20th-23rd October and the second came a few days later on 26th-30th October 1998.

Flood "One": Tuesday 20th – Friday 23rd October

In the evening of 20th October extremely high rainfall intensities of 25 to 30 mm per hour were monitored in the Tararua Ranges. By 10 p.m. the Kapiti Coast emergency headquarters was operational and a Civil Defence Emergency was officially declared at 11:30 p.m.

Otaihanga Park inundated by floodwaters, 21 October 1998

Floodwaters and heavy rain resulted in 15 businesses being flooded, 26 homes evacuated and 220 homes affected throughout the District. A slip closed State Highway One south of Paraparaumu.

Flood "Two": Monday 26 – Friday 30 October

Early forecasts were received from the Meteorological Service at noon Monday, with a special weather bulletin predicting 380 to 450 mm rainfall in the 30 hours from midday Tuesday. This lead-in time allowed all emergency services to be advised and briefed and a computer-driven headquarters established.

This time there was a slower rain build up than in the first flood. The second state of emergency was declared at 8:00 a.m. Wednesday 28 October.

While river levels had receded somewhat from the first event, very wet catchment conditions remained. This resulted in the second event causing more property damage and one death in Waikanae (Table 6.2). At the same time other parts of the lower North Island were also experiencing flooding, including Hutt Valley, Wairarapa, Wanganui and Taumaranui.

Property damage resulting from October 1998 floods.

	Evacuations	*Homes flooded*	*Properties pumped*	*Homes affected by sewage*
Flood "One"	26	140	208	5
Flood "Two"	26	110	240	5
Total	52	250	448	10

Table 6. 2

The total cost of KCDC operations for the two floods was almost one million dollars (Table 6.3). This figure does not include costs to homeowners, insurance companies and other infrastructure services (e.g. Transit New Zealand). The total cost is expected to be in the tens of millions of dollars.

Comparison of operational costs and activities for October 1998 floods.

	Flood "One"	*Flood "Two"*	*Total*
Properties sand bagged	120	160	280
Sand bags used	5,000	6,000	11,000
Properties pumped	208	240	488
Response time (hours)	72	96	168
Hours worked (approx. 250 people)	18,000	24,000	42,000
Cost per flood	$360,000	$480,000	**$840,000**

Table 6. 3

Number of properties in 1% flood zone

There are 4,643 properties located in the 1% flood area.

The effects of flooding can be defined and predicted reasonably accurately. The Wellington Regional Council has used sophisticated computer models and data from past events to predict areas that will be inundated by floodwaters from the major Kapiti Coast rivers. A key result of the computer modelling is the identification of the 1% flood extent. The extent is defined as the area that has a 1% chance of being flooded each year and thus will flood, on average, once every 100 years. Large floods can occur in successive years or even more than once within the same year. Figure 6.2 shows the 1% flood area for the Kapiti Coast. Most flooding is associated with the Otaki and Waikanae Rivers in their lower reaches.

By keeping records of the number of new houses and buildings in the 1% flood zone, the risk from flooding can be measured. If the number of properties is increased in the 1% flood zone the risk may also be increasing. However, in determining risk, mitigation measures must also be taken into account. For example, building new homes with raised floor levels can reduce flood damage and thus reduce risk.

The Council has provisions in the District Plan limiting development in flood prone areas. There are currently 4,643 properties in the 1% flood zone. In future years, changes in property numbers and risk can be monitored to ensure that the District Plan provisions are succeeding in managing the flood hazard.

Figure 6.2(a): Natural hazards—Otaki

Figure 6.2(b): Natural hazards—Waikanae, Paraparaumu, Raumati, and Paekakariki

Number of earthquakes

Earthquakes are monitored throughout New Zealand by the Institute of Geological and Nuclear Sciences (IGNS). Estimates of seismic hazard are made from the results of this monitoring, as well as from the study of active faults. In 1986, IGNS completed a study of earthquake hazard in New Zealand, which showed the probability of ground shaking of various intensities. The findings for the Kapiti area are shown

in Table 6.4. The ground shaking intensity scale ranges from 1 (felt by a very few people under exceptionally favourable circumstances) to 12 (damage virtually total, with practically all works of construction destroyed or greatly damaged).

Predicted earthquake frequencies.			
Ground shaking intensity	*Effect of shaking*	*Earthquake frequency*	*Chance per year*
level 6	felt by all	once every 7 years	14%
level 8	steering of cars greatly affected (would have to stop)	once every 100 years	more than 1%
level 9	general panic	once every 500 years	10% within 50 years
level 10	Mainly masonry buildings, some other buildings destroyed	once every 1000 years	5% within 50 years

Table 6. 4

The Richter Scale is the most commonly referred to measure of earthquake intensity. The Richter Scale measures earthquake intensities in magnitudes that increase exponentially. The known historical earthquakes of greater than magnitude 5 are shown in Table 6.5. Earthquake magnitude, shown in Table 6.5, is a measure of the amount of energy released in the earthquake rupture, and generally the greater the magnitude the stronger the ground shaking when the distance from the fault dislocation is the same. For example, the 1942 Wairarapa Earthquake was Magnitude 7.2 and the felt intensity in the Kapiti Coast was 6 to 7.

Number of known historic earthquakes within 100 km of Waikanae.				
Magnitude (Richter scale)	5.0 to 5.9	6.0 to 6.9	7.0-7.9	8.0 +
No. of earthquakes	33	4	2	1

Table 6. 5

Fault lines have also been mapped in the District (Figure 6.2) and land close to fault lines can be subject to large vertical and horizontal displacements during earthquakes. Consequently, the District Plan limits new development near identified fault lines.

Number of properties in earthquake zones

Earthquake hazard zones can be identified based on the different material types underlying the Kapiti Coast and knowledge of how various materials respond to seismic waves. The Kapiti Coast has been divided into three earthquake zones with zone one being the low hazard and zone three high hazard. Zone one is underlain by bedrock and includes the hilly and mountainous areas of the District. Zone two includes the fan-deposit slopes between the hills and coastal plain, while zone three is typically underlain by beach and dune sands, river and fan alluvium and peat.

Summary

Number of floods and earthquakes		The Kapiti Coast is a particularly flood prone area with problematic river systems dissecting developed areas.
Properties in the 1% Flood Zone and Earthquake Zone Three		KCDC and Wellington Regional Council have worked closely together to develop flood and earthquake hazard maps. These maps have been used by KCDC in the District Plan to prevent and control development in the most hazard-prone areas.
Emergency preparedness		KCDC staff and systems performed well during the October 1998 floods.

What is the Council doing to protect the District from natural hazards?

- *Planning controls are in place through the District Plan to ensure that new developments are not located in high hazard areas.*
- *Maintaining a Civil Defence department to co-ordinate disaster planning and relief during events.*
- *Educating the community on emergency preparedness.*

What are other organisations doing?

- *Wellington Regional Council carries out monitoring and studies to define areas affected by natural hazards.*
- *The Ministry of Civil Defence provides advice and material on natural disasters and how best to prepare for them.*

What you can do to help

- *Keep your insurance cover up-to-date.*
- *Ensure that your family has an emergency plan.*
- *Know whether you live near potential hazard areas.*
- *Have an emergency kit and drinking water ready.*

Contacts for further information

- *Emergency Manager—Kapiti Coast District Council (04) 904 5836*
- *Wellington Regional Council (04) 384 5708*
- *Ministry of Civil Defence (04) 473 7363*

7. Solid Waste and Hazardous Substances

Objectives for managing solid waste and hazardous substances

- *The reduction in the quantity of solid waste generated and disposed to landfill.*
- *To minimise the adverse effects of solid waste on the environment.*
- *The prevention or mitigation of any adverse environmental effects caused by the storage, use, transport or disposal of hazardous substances.*

What is waste?

Waste disposal requires careful management to avoid adverse effects on the environment

Waste is generated by many human activities that are part of everyday living. The environmental effects of waste vary with the toxicity and quantity produced and includes the contamination of soil, rivers, groundwater and surface water. Waste can exist in a solid, gaseous or liquid form. This chapter deals only with solid waste.

What is waste?
Waste can be defined as:

"Materials and energy which have no further use and are released to the environment as a means of disposal" *(Ministry for the Environment (MfE), 1998)*

What is a hazardous substance?
Hazardous substances can be defined as:

"Any substance with one or more of the following intrinsic properties; explosiveness, flammability, a capacity to oxidise, corrosiveness, toxicity, ecotoxicity with or without bioaccumulation; or which on contact with air or water generates a substance with any one or more of the properties specified above" *(MfE 1998)*

The effect of solid waste and hazardous substances on the environment

Uncontrolled disposal of waste and hazardous substances can have a significant adverse effect on the natural environment, including surface and groundwater, the coastal environment, soil and air.

The majority of waste in the District is disposed of via landfills. The effects of landfills include odour, pests, reduced amenity values and groundwater and surface-water contamination from leachate. Eventually, landfills reach capacity. Establishing a new landfill is a complex, costly and time-consuming process.

Hazardous substances are often discarded as waste once they are no longer required. Hazardous waste can have considerable adverse effects on the environment. Management systems are needed to ensure the safe use, storage, transport and disposal of hazardous substances. Incorrect management and disposal presents a significant threat to ecosystems and the wider environment. The inappropriate disposal of hazardous substances can result in contaminated sites.

Key issues for solid waste and hazardous substances management

- *Effects of solid waste disposal on the surrounding environment, for example surface water, groundwater and soil.*
- *The volume and type of waste generated and disposed to landfill.*
- *Remediating existing contaminated sites and preventing new sites resulting from inappropriate use, storage and disposal of hazardous substances.*
- *The prevention of incidents which involve hazardous substances.*

What we know about solid waste and hazardous substance management in the District

Table 7.1 presents a list of indicators that we can use to monitor solid waste and hazardous substance management.

Indicators for managing solid waste and hazardous substances	
Issues	**Indicators**
Effects of solid waste disposal	• *Quantity and type of waste disposed to landfills* • *Quantity of waste which is recycled*
The prevention of incidents involving hazardous waste and hazardous substances	• *Number of incidents and spills involving hazardous substances* • *Number of Dangerous Goods Licences issued*
The prevention and remediation of contaminated sites from inappropriate use and storage of hazardous substances	• *Number of contaminated sites in the District*

Table 7. 1

Effects of solid waste disposal

Waste collection

The Council has a variety of methods for managing the waste generated by residents, including;

- *Kerbside rubbish collection with disposal to landfill.*
- *Kerbside collection of newspaper for recycling.*
- *Provision of recycling facilities.*
- *Composting of green waste.*

Rubbish bag collection is available to approximately 99% of the District's population, either through the Council's collection system or private contractors.

Kapiti Coast District Council operates two landfills, at Waikanae and Otaihanga, and a refuse transfer station at Otaki. Waste from the Otaki transfer station is disposed of at the Otaihanga landfill. Both landfills are open seven days a week, with controlled disposal hours.

The Waikanae landfill is not "engineered" or designed as well as newer landfills. This means that leachate and methane produced when waste breaks down or decomposes is not collected. A leachate collection system was recently installed at Otaihanga landfill, with disposal to the adjacent sewage treatment plant. Council is also increasing the use of cover material over the landfill to minimise the amount of rain water, which leaches contaminants into the soil and groundwater.

One of the key adverse effects is leachate from landfills contaminating groundwater. Monitoring at both the Waikanae and Otaihanga landfills shows that leachate is not significantly affecting groundwater.

Volume of waste

The volume of waste in Kapiti generated per person has increased by 23% between 1994 and 1998

There has been a 23% increase in the total quantity of the waste stream on the Kapiti Coast between 1994 and 1998. During this period the Kapiti Coast's population has increased by 10.5%. The total volume of waste disposed of for each person has increased from 0.878 tonnes to 0.963 tonnes per person per year. The average for New Zealand is 0.898 tonnes per person per year.

Volume of waste (1998)	
Waikanae Landfill	9,342 tonnes
Otaihanga Landfill	24,611 tonnes
Otaki Transfer Station	4,588 tonnes
TOTAL	**38,541 tonnes**

Table 7. 2

Note: As a result of recycling and greenwaste composting the total volume of waste to landfills has been reduced by 17%. This has resulted in only a small net increase of waste deposited at the landfills of only 2% from 1994 to 1998.

The Kapiti Coast disposes of more than 38,000 tonnes of waste each year

Over one third of the waste was disposed by residents (38%), while commercial and industrial waste and cleanfill generated 33% and 29% respectively.

The Otaihanga landfill is not expected to reach full capacity for another 25 years. However, the Waikanae landfill is expected to reach full capacity in three years. Once capacity is reached, the Council proposes to rationalise waste disposal and use only the Otaihanga landfill. This will mean that all the District's waste will be disposed of at a fully engineered landfill with leachate collection facilities.

Type of waste

The Council commissioned a waste stream analysis survey in December 1994 and July 1998. Both landfills and the transfer station were surveyed in 1998. The Otaihanga landfill was the only one surveyed in 1994. These surveys are used to determine the source, composition and seasonality of waste produced in the District.

Findings showed that a large percentage of the waste being disposed of to the landfills could be reused, recycled or composted.

The amount of recyclable waste going to landfill is decreasing.

Kitchen and garden waste (compostable waste) is the largest proportion of waste, at 41% disposed in 1994, but this reduced to only 20% of the waste stream in 1998. This is due to the establishment of composting plants at the landfills that recycle kitchen and garden waste.

Paper, glass and plastic form the next largest components of the waste stream. Quantities of these three wastes decreased between 1994 and 1998.

Overall, the proportion the kitchen and garden waste in the waste stream has decreased, even though there has been an increased in the total amount of waste disposed.

Figure 7.1: Waste composition—Otaihanga landfill (1994)

Figure 7.2: Waste composition—Otaihanga landfill / Otaki transfer station (1998). *Note: a large amount of waste from a construction/demolition project was disposed to the landfill during the 1998 WAP survey week.*

The amount of metal and potentially hazardous substances identified in the waste stream from 1994 to 1998 has remained very similar.

A significant percentage of the waste disposed of on the Kapiti Coast can be reused, recycled or reduced.

Potentially hazardous waste includes;

- *Car batteries*
- *Aerosols*
- *Bleaches and detergents*
- *Fluorescent tubes*
- *Mechanical oil and fluids*
- *Paint*
- *Agrochemicals, poisons and insecticides; and*
- *Medicines*

What is the waste stream analysis used for?

Information from the waste stream analysis survey can be used to target waste for reduction. It is clear from the survey results that establishing a composting plant at the Otaihanga Landfill has decreased the quantity of greenwaste disposed to landfill. The amount of paper disposed has also halved, due to the kerbside collection of newspapers, which began in 1995.

Paper and soil remain in significant proportions in the waste stream, and can be recycled.

Waste recycling

Reduce ***the amount of waste***
Reuse ***products for as long as possible***
Recycling ***products such as cans, bottles, paper, clothing and plastics***

Between 1994 and 1998 the total quantity of waste recycled in the District increased from 700 tonnes to 5590 tonnes. The increase is a result of composting plants installed at both landfills, and the establishing of six recycling facilities throughout the District, recycling glass, paper, metal, plastic and oil.

Table 7.3 indicates the volume and type of waste collected for recycling. According to Council's Waste Management Plan (prepared in July 1998), recycling accounts for approximately 4.6% of the waste stream.

Type and volume of recyclable waste		
Material	**Annual Weight**	**Source**
Plastics	30 tonnes	From recycling station
Aluminium Cans	7 tonnes	From recycling station
Paper	130 tonnes	From Kerbside collection
Paper	130 tonnes	From recycling stations
Glass	300 tonnes *	From bottle banks
Organic Kitchen	1,000 tonnes*	Supermarket waste diverted for pig food
Textiles	80 tonnes	Used clothing bins
Scrap Metal	200 tonnes*	From landfills
TOTAL	**1877 tonnes**	

Table 7. 3

*Estimates of unknown accuracy

The 1998 waste stream analysis survey included an analysis of organic material. Results show that the quantity of organic

waste being disposed of at the landfill has decreased by 30% between 1994 and 1998.

The Council provides composting plants at the Otaki Transfer Station, and the Waikanae and Otaihanga Landfills. 3690 tonnes of shredded waste was composted during the first six months in 1998. Information is not available for the rest of 1998.

Shredded Greenwaste (January-June 1998)				
	Otaki	**Waikanae**	**Otaihanga**	**Total**
Annual Weight (tonnes)	580	1150	1960	3690
Population Served	8452	8963	23404	40819
Rate of Generation kg / capita / year	69	128	84	90

Table 7. 4

Organic waste		
	Total District Annual Tonnes	**% of Total Organic Waste**
Shredded Greenwaste	3690	27%
Landfilled Greenwaste	7495	54%
Kitchen	2675	19%
TOTAL	13860	

Table 7. 5

Management of hazardous waste

There are no specific collection facilities for hazardous waste on the Kapiti Coast. However, the Kapiti Coast has few producers of potentially hazardous waste, due to the lack of heavy industry. Most of the hazardous waste produced is oil or paint.

Council monitors the type of waste disposed of to landfills. Small amounts of domestic hazardous waste, which are stored at Otaihanga Landfill, are taken away and stored by specialist licensed disposal companies.

Hazardous substances legislation

The management of hazardous substances is covered by the Dangerous Goods Act 1974. The Act is being superseded by the Hazardous Substances and New Organisms Act 1996 (HSNO), which is being progressively implemented for full implementation in 2000.

What is the Hazardous Substances and New Organisms Act?

The HSNO legislation will be administered by the Environmental Risk Management Authority (ERMA), on behalf of the Ministry for the Environment. This legislation repeals several older Acts, including the Explosives Act 1957, the Dangerous Good Act 1974, the Toxic Substances Act 1979 and the Pesticides Act 1979. Kapiti Coast District Council will continue to play a role in hazardous substances management, by licensing premises using hazardous substances and being involved in emergency situations.

Quantity of hazardous waste disposed of to landfill

The amount of hazardous waste disposed to landfill decreased by 39% between 1994 and 1998.

Kapiti Coast disposed 113 tonnes of potentially hazardous waste to landfills in 1998, the majority of which was disposed to the Otaihanga landfill. This compares to 157 tonnes in 1994 and is a reduction of 39%. The reason for the reduction is unknown.

Dangerous Goods Licences

There are eight classes of hazardous substances. Controlling the use, storage and transport of four of these is the responsibility of Council.

- *Class 2 – Gases*
- *Class 3 – Flammable liquids*
- *Class 4 – Flammable solids*
- *Class 5 – Oxidising substances*

Central government is responsible for controlling the remaining 4 classes of hazardous substances;

- *Class 1 – Explosives*
- *Class 6 – Poisonous substances*
- *Class 7 – Radioactive materials*
- *Class 8 - Corrosives*

Dangerous Goods Licenses are required for the storage and use of hazardous substances, for example petrol, diesel or gases. The Council issued 95 dangerous goods licenses in 1998. These licenses are issued for one year, and a monitoring inspection by Council is required to check appropriate management before reissue.

Number of incidents and spills involving hazardous substances

In 1998/99 Council attended 38 minor incidents/call outs for hazardous substances. The New Zealand Fire Service (NZFS) attended 18 hazardous substance spills during the same period. 37 spills have been attended by the fire service since 1995; all but five of these spills involved Class 2 and 3 substances. Waikanae, Paekakariki and Paraparaumu stations attended the incidents.

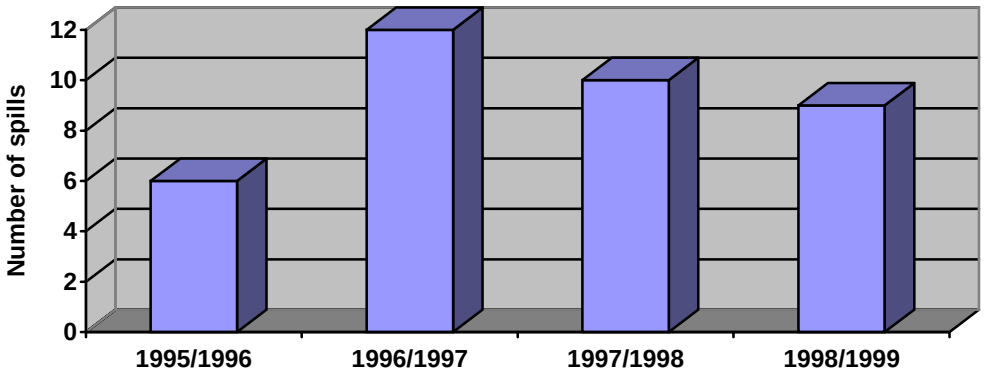

Figure 7.3. Number of hazardous substances spill attended by New Zealand Fire Service

Contaminated sites on the Kapiti Coast

Kapiti Coast has 118 recorded potentially contaminated sites. Council does not currently have a programme in place to investigate potentially contaminated sites to determine their existence or significance or to remediate any confirmed contaminated sites.

For more information on the effect of **waste and hazardous substances** on surface water and ground water, call the Wellington Regional Council.

Education initiatives

Council supports waste reduction initiatives through provision of *"A Word on Waste"* education booklets to all

District schools, and other material to the public. Refuse bags are printed with an educational message, and the Mayor's newsletter has focused on waste minimisation.

Summary

Waste disposal		Waste disposal volumes at Kapiti's two landfills increased by 23% over a four-year period. However, the amount of green waste has decreased, with a concurrent rise in waste being composted and recycled. Waikanae landfill will reach capacity in 2001, leaving the District with one landfill for non-recycled waste.
Recycling		Recycling of waste has increased from 700 tonnes in 1994 to 5590 in 1998/99, an increase of 685% in four years. Key reasons for the increase are the collection of newspapers, and establishing composting plants at both landfills.
Landfill management		The Waikanae landfill does not collect leachate from waste decomposition. There is discharge of leachate into the groundwater which although not considered to be significant, it could potentially have a minor effect on groundwater. The Otaihanga landfill has a leachate collection system installed, with disposal to the sewage treatment plant. To date, monitoring shows no significant adverse effects on groundwater.
Hazardous substances		Kapiti Coast has 118 potentially contaminated sites. Currently, there is no system in place to assess the level of contamination, or remediation requirements of any of these sites. There is a lack of information about the quantity of hazardous substances stored on the coast. Although no major incidents have occurred, there have been a number of smaller incidents.

What is the Council doing to manage waste and hazardous substances

- *Preparing waste management plans to identify priorities for waste management and reduction.*
- *Continuing waste stream analysis.*
- *Monitoring the effects of waste disposed at landfills on the environment.*

- *Encouraging recycling and composting of waste by providing better facilities at landfills, and kerbside collection.*

What you can do to help

- *Compost green waste, either at the landfill or at home for use in the garden*
- *Recycle glass, metal, paper and plastic. Take used oil to collection centres.*
- *Reduce the amount of packaging. Buy products with less packing, or buy in bulk.*
- *Store and use hazardous substances correctly.*
- *Dispose of unwanted hazardous substances in an appropriate manner.*

Who you can contact for further information

Operations Engineer at Kapiti Coast District Council on (04) 904 5853

References

- *Agfirst Consultants (1998) Analysis of Waste—Otaihanga Landfill and Waikanae Landfill Lincoln, New Zealand*
- *Agfirst Consultants (1995) Analysis of Waste—Otaihanga Landfill—November/December 1994, Lincoln, New Zealand*
- *Ministry for the Environment (1997) The State of New Zealand's Environment Wellington, New Zealand.*
- *Montgomery Watson (1998) Kapiti Coast District Council—Proposed Solid Waste Management Plan, Wellington, New Zealand.*

8. Subdivision and Development

Objective for subdivision and development

- *To ensure that subdivision and development maintains and enhances the environmental character and amenity values of residential areas and avoids or minimises adverse impacts on the environment*

Subdivision and development on the Kapiti Coast

The Kapiti Coast has undergone significant development over the last 10 years, due to a high growth in local employment and the increasing desirability of the Coast as a place to live and to retire.

The Kapiti Coast has experienced significant development over the last 10 years.

The District is characterised by several distinct urban areas, including Waikanae, Otaki, Paraparaumu and Paekakariki, which are linked by residential development along the coastal margin.

Urban development on the coast is limited by existing landforms and land use, including;

- *Steep topography to the east, the Tararua Ranges*
- *The coast to the west.*
- *Location of existing utilities, such as wastewater treatment plant and the landfills.*
- *Greenbelt between Waikanae and Paraparaumu.*
- *Main transport corridors such as the railway line and State Highway One.*
- *Floodprone land.*
- *Conservation areas.*

The effect of subdivision and development on the environment

Residential subdivision and development is the driving force for change of urban form and demographics on the Kapiti Coast. Although residential land forms less than 4% of the District's total land area, it contains 92% of the total population. The projected continuing increase of the Coast's population means additional residentially zoned land for subdivision and development will need to be provided over

the next 5-25 years. Such development can have both negative and positive effects on the environment.

Increasing building densities can affect the expected amenity and character of existing residential development, for example houses located close together, and increased traffic on local streets. The desire for greenfield development (new developments in open space) means urban boundaries expand, resulting in encroachment on rural land, which then affects rural character. This can cause conflicts between rural activities and residential amenity.

Residential development in rural areas can lead to conflicts between rural activities and residential amenity.

Development in the rural area can also result in an increase in complaints regarding spray drift, noise and odour, as conflicts arise between the operation of rural properties, and new residents seeking a 'quiet' rural lifestyle.

Increased urban development places demands on already stretched existing infrastructure, including water and wastewater services and transport.

Rural development also impacts on the environment. The cumulative effects of individual subdivisions, including "lifestyle" blocks, changes requirements for transportation and provision of services. More roads may be required, and an increased level of water and wastewater services demanded. This can have significant implications for developers and the Council.

Over time development inevitably changes the character of an area.

However, development can also have positive effects. Increased subdivision can help create economic opportunities, including an increase in money spent on construction and other building related services. Increased population helps support local businesses, creates employment opportunities and increases local spending power.

Over time, subdivision and development, whether residential, commercial or rural, irretrievably changes the character of an area.

Key issues for subdivision and development

- *Subdivision and development impacts on the character and amenity values of residential areas.*
- *Subdivision and development impacts on rural amenity, rural character and the environment.*
- *Increasing development places pressure on existing services* (refer to Chapter 2 Water and Waste Services).

What we know about subdivision and development on the Kapiti Coast

Table 8.1 presents a list of indicators we can use to monitor the effects of subdivision and development. The indicators provide information that helps us understand our performance in achieving the objectives for subdivision and development and dealing with the key issues described above.

Indicators for monitoring subdivision and development	
Issue	**Indicators**

Effect of subdivision and development on amenity values, residential and rural character and the environment.	• *Number of building consents granted.*
	• *Subdivision consents applied for and granted by type:*
	  • *Greenfield*
	  • *Redevelopment*
	  • *Crosslease*
	  • *Infill*
	• *Subdivision consents granted in:*
	  • *Outstanding landscape areas*
	  • *Coastal dunes*
	• *Density of buildings on residentially zoned land.*
	• *Area and location of open space.*
	• *Complaints about impact of rural activities on residential amenity.*
	• *Change in land zoning.*

Table 8. 1

Consent Statistics

Building Consents

Kapiti covers a total land area of 730.6 square kilometres.

Building consents are a good indication of the amount of development occurring in a District. Economic conditions and the rate of population growth influence the number of consents applied for. The number of building issued by Council has increased steadily since 1992. In the 1997/1998 financial year, the number of building consents issues for new dwellings increased by 30% over the previous year. The number of houses built on the Kapiti Coast exceeded that of all other Districts in the country except for Auckland and Tauranga.

Number of building consents has increased by 30% since 1992.

In 1998, 235 building consents were issued for dwellings located in Paraparaumu and 140 in Waikanae, out of a total of 448 building consents for dwellings.

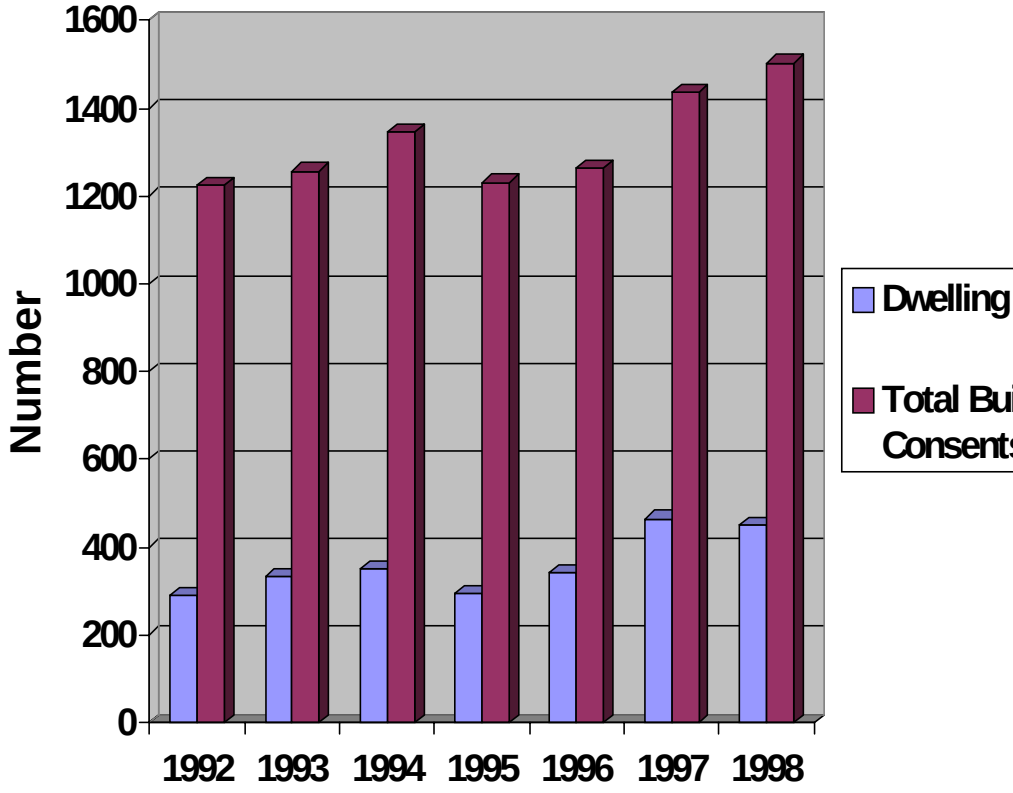

Figure 8.1. Number of dwelling consents issued* versus *total number of building consents

Subdivision consents

Kapiti Coast is also experiencing high levels of residential subdivision activity with 424 residential lots approved in 1998. This is evidence of the popularity of the Kapiti Coast as a place to live. In contrast, the number of rural lots approved, after peaking at 131 in 1996, have reduced to 45 and 47 for 1997 and 1998 respectively.

Most subdivision and development is occurring in Waikanae and Paraparaumu/Raumati. The majority of subdivisions in Waikanae are for infill development, while the Paraparaumu/Raumati area is characterised by greenfields development. Overall, greenfield subdivision is more prevalent.

What is "infill" and "greenfield" subdivision?
Council defines infill subdivision as subdivision with up to four allotments, while greenfields subdivision result in the creation of more than four allotments. Traditionally, greenfields development has involved the creation of allotments from

previously "undeveloped" land, whereas infill subdivision involves subdividing land that already contains a dwelling into more allotments.

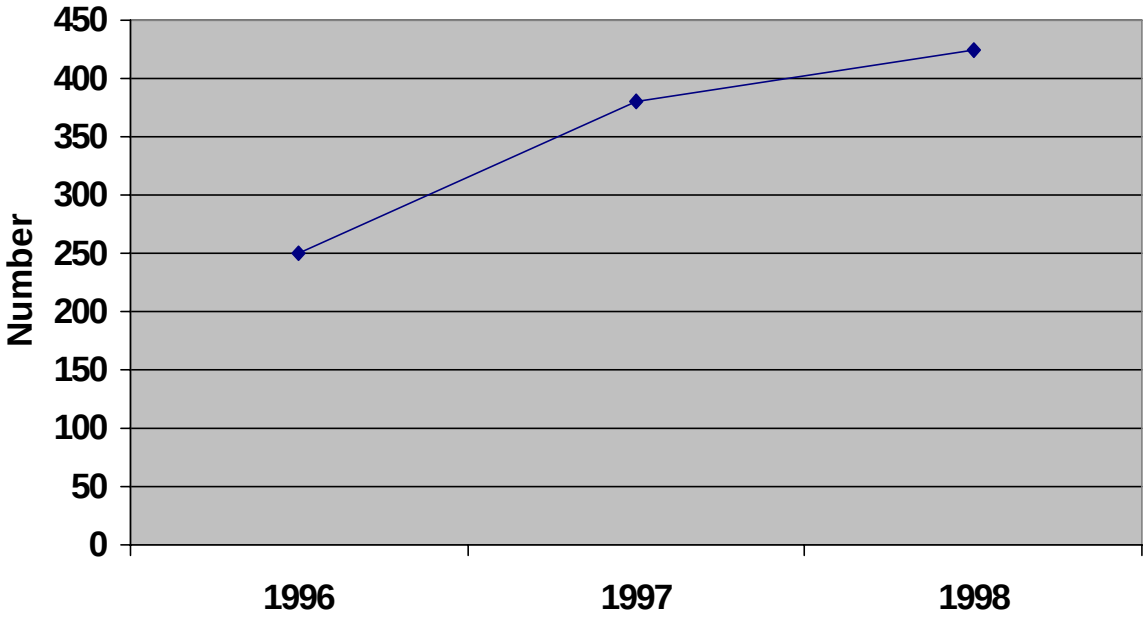

Figure 8.3. Number of residential lots approved through subdivision consents (1996-1998)

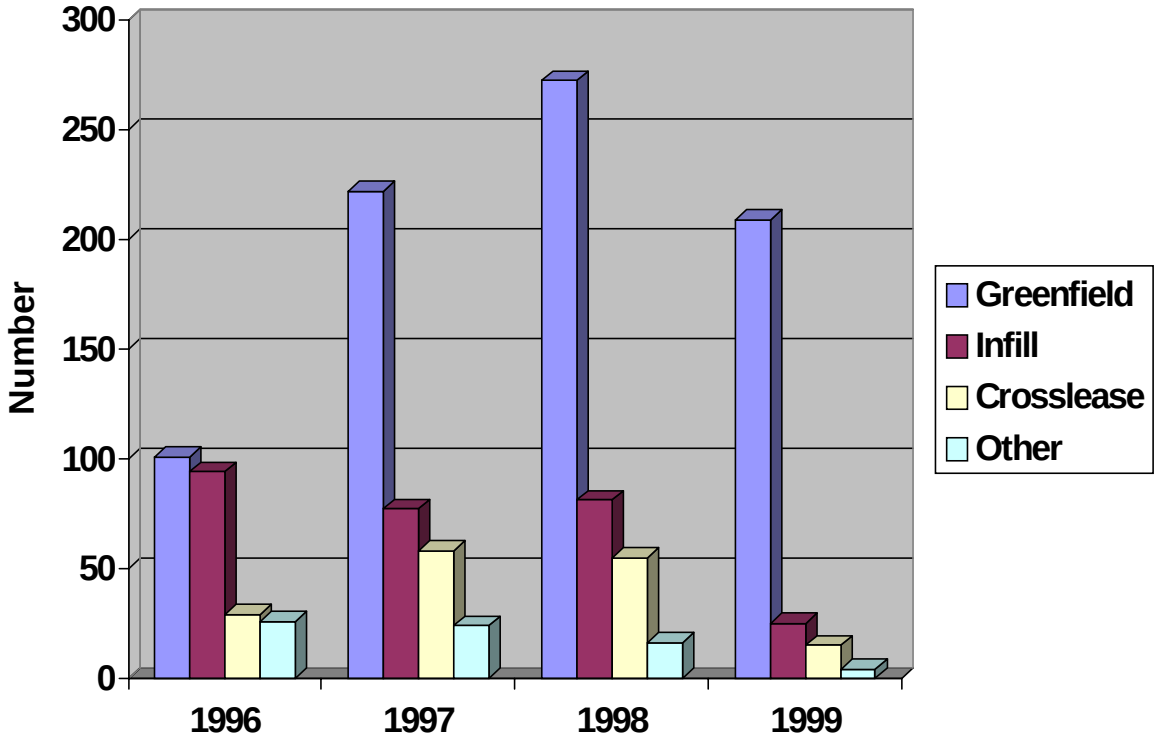

Figure 8.4. Type of subdivision (1996-April 1999)

The location of subdivisions approved by Council between 1990 and 1999 is identified in Figure 8.5.

Figure 8.5: Major subdivision/development 1990-1999

Subdivision in coastal areas

Council approved 31 subdivisions for coastal beachfront properties between 1992 and 1998. Of these subdivisions 26 were "infill" subdivisions, which subdivided existing allotments, resulting in intensification of landuse in that area. Most of the subdivisions occurred in Paraparaumu/Raumati and the rural area of Te Horo/Peka Peka *(refer to Chapter 1 – Coastal Environment for information about the effect of subdivision and development in the coastal environment).*

Coastal subdivision summary (1992-1998)			
Urban Area	**Number of Allotments**	**Area of Land Subdivided**	**Average Lot Size**
Otaki			
Te Horo/Peka Peka	67	243ha	3.6ha
Waikanae			
Paraparaumu/Raumati	132	19.28ha	0.146ha (1460m^2)
Paekakariki	1	0.045ha	0.045ha (450m^2)

Table 8. 2

Subdivision in outstanding landscapes

Council has approved 17 consents for subdivision in outstanding landscapes between 1992 and 1999 (to date) *(refer to Chapter 5 - Landscape and Natural Environment for more information about the effect of subdivision on outstanding landscapes).*

Subdivision and development

Building density

Building density (number of buildings per hectare) is a good indicator for assessing amenity in residential areas but is less effective in rural areas given the significantly lower densities.

Kapiti has an average building density of one house for every 1644m^2 of land in residential zoned areas. This is a low density, and is influenced by the lack of development in some residentially zoned areas, for example Peka Peka. Residential building densities on the Kapiti Coast range from one building per 901 m^2 to one building every 3686m^2.

Low density development has significant implications for the environment. Large amounts of land are required to sustain

the large allotment sizes, and the infrastructure required to service these allotments. Dispersed forms of urban development generate higher operating and maintenance costs for infrastructure.

Land availability

If current trends continue, more residential land will be required for development on the Kapiti Coast in the next 25 years. Projected demand for residential land will exceed supply by approximately 3000 households. Approximately 200 hectares of land is required. Rural land will need to be rezoned to residential zone. A significant portion of this development is likely to occur in the Paraparaumu/Raumati and Waikanae areas. The requirement for rezoning is projected to begin within the next 5-10 years.

It is expected that more land for urban development will be required by 2001. Council will be preparing for this with the release of a discussion paper in September 1999 on the issues and options for future urban development on the Kapiti Coast.

A 1999 report prepared for Kapiti Coast District Council by Monitoring and Evaluation Research Associates Limited (MERA) projected that the majority (57.7%) of household growth over the next 13 years, would continue to be in the Paraparaumu/Raumati area, with 23.9% in the Waikanae area.

The MERA report also projected that an estimated 4600 additional people would be employed in the Kapiti Coast District by 2021, an increase of 46%, from 1996. An increasing number of people will be employed within the District, rather than commuting to work outside the District. This reflects a maturing of the District with less reliance on Wellington for employment. This will place pressure on existing local transportation networks, but is likely to reduce pressure on State Highway One.

Land utilisation

What is land utilisation
An urban area is considered to be fully utilised when there is no more vacant land capable of having a house constructed on it. Floodprone and steep land is excluded from this definition.

The high demand for land in Kapiti has resulted in high land utilisation in some urban areas. In Waikanae Central, for

example, 87% of the available land is utilised. Yet this is one area where further high residential growth is anticipated. Similarly, in Raumati South 84% of the available land is currently utilised.

The current high land utilisation, in combination with the projected demand for residential land, is driving the requirement for additional residentially zoned land in the next 25 years.

Zoning

Many of the issues facing the Kapiti Coast concern the effects of urban development. However, only a small percentage of the District is actually zoned for urban purposes. Nearly half the District includes land vested in the Crown, for example Tararua Forest Park. Table 8.3 shows the area and percentage of land in each zone throughout the District.

Areas of zoned land (1997)		
Zone	**Area in hectares**	**Percentage of District Area**
Residential	2,449.7	3.08
Rural	33,082.6	45.28
Commercial / Retail	46.2	0.06
Paraparaumu Town Centre	58.0	0.08
Industrial / Service	123.8	0.17
Open Space	1,586.9	2.17
River Corridor	558.6	0.76
Conservation	32,154.2	48.12
TOTAL	**73,060.0**	

Table 8. 3

Half of the District is zoned as Conservation and Open Space (50.29%). The Conservation zone includes the Tararua Forest Park, Kapiti Island and other reserves managed by the Department of Conservation (DoC). The Open Space Zone includes areas private land generally not available for development, the golf course, and Queen Elizabeth Park (638ha) which is managed as a regional park by Wellington Regional Council. The remainder of the zone includes land managed by Council as recreation, local purpose and scenic reserves *(refer to Chapter 4 – Open Space and Reserves).*

This places constraints on the area of land available for residential/commercial development or subdivision.

As a result of submissions to the Proposed Kapiti Coast District Plan, the zoning of some land has changed. 17 hectares of rural land have been rezoned as residential and the area of land zoned as Open Space has increased by 68% since 1997. However, there has been an overall loss of 8 hectares of Residential land, as a result of incidental zoning changes since 1995. This has implications for the projected future demand for residential land, as a reduction in residentially zoned land now will increase the demand in the next 25 years.

Summary

Building density		Residential building density on the Kapiti Coast is low, which reflects large lot sizes. Density is expected to increase over the next 15 years as demand for residential land grows and the population increases.
Land zoning		Over 50% of the District's land area is zoned as Conservation or Open Space land. This includes Tararua Forest Park and Queen Elizabeth Park. Changes to zoning as a result of submissions to the District Plan have resulted in rezoning of some land from rural to residential, and an increase in the amount of Open Space zoned land. Overall, however, there has been a reduction in residentially zoned land.
Development in sensitive areas		Several large subdivisions were approved in areas identified as outstanding landscapes by Kapiti Coast District Council. Subdivision is also being approved in the coastal environment. Conditions on these consents ensure that adverse effects on amenity and character are minimised.
Development pressure		Projected population growth on the Coast means that an additional 200 hectares of residential land will be required in the next 25 years. This will place pressure on existing water and waste services and on the transportation network.

What the Council is doing to manage the effects of subdivision and development

- *Rules in the District Plan limit subdivision and development in sensitive areas.*
- *Undertaking studies into projected population growth and development on the Coast.*
- *Carrying out an urban growth study for release in September 1999*

Who you can contact for further information

District Planner – Kapiti Coast District Council (04) 904 5828

References

Monitoring and Evaluation Research Associates Limited (March 1999) *Growth Projections Technical Report – Kapiti Development Trends Study*, Wellington, New Zealand.

Monitoring and Evaluation Research Associates Limited (March 1999) *Community Profile Report – Kapiti Development Trends Study*, Wellington, New Zealand.

9. Noise

Objectives for managing noise

- *To ensure that the adverse effects of noise from non-residential activities on residential amenity values is avoided, remedied or mitigated.*
- *To ensure that the adverse effects of road traffic noise on the amenity values of the residential environment are avoided, remedied or mitigated.*
- *To minimise the adverse noise effects of aircraft using Paraparaumu Airport on the amenity values of nearby residential environments.*

What is noise?

Noise is defined as unwanted sound. Noise in the environment detracts from area amenity and can affect community health and welfare by interrupting sleep patterns, communication, relaxation and work.

There are a number of reasons why sound becomes unwanted:

- *Frequency or volume of sound.*
- *Duration.*
- *Background environment.*
- *Time when the sound is heard.*
- *History of personal noise exposure.*
- *Listener's frame of mind.*

Kapiti Coast District Council has functions under the Resource Management Act 1991 to control excessive noise.

The Resource Management Act 1991 requires District Councils to control the effects of excessive noise.

What is excessive noise?
Excessive noise means a "human-made" noise that unreasonably interferes with the peace, comfort and convenience of any person. Excessive noise can include noise from machines, musical instruments or an explosion or vibration.

The Resource Management Act excludes the following items from the definition of excessive noise:

- *Aircraft noise.*
- *Normal traffic noise on a public road.*
- *Trains (unless in railway yards or in a railway station).*

Indicators for noise	
Issue	**Indicator**
Effects of noise from different sources on amenity values.	• *Number of noise complaints.* • *Ambient noise levels.*

Table 9. 1

Effect of noise on amenity values

Noise complaints

Complaints about noise are on the increase in communities around New Zealand. This reflects the level of concern about noise in the community. However, it should be noted that the rise in complaints might also reflect an increasing awareness of the complaint service or increased sensitivity of the community to noise.

Kapiti Coast District Council received 898 complaints about noise in 1998.

Kapiti Coast District Council records and actions (where necessary) any noise complaints received through their 24-hour Noise Control Service. The number of complaints received is an indicator, which can be used for monitoring the extent to which noise on the Kapiti Coast is compromising amenity values or community health.

The number of noise complaints received by Council has risen by 122% between 1994 and 1998, from 404 to 898 per year. The number of excessive noise directions as a result of noise complaints has also risen during the same period, by 246%. The proportion of excessive noise directions issued to total noise complaints has increased, from 12% in 1994 to 18% in 1998. This means that Council officers are issuing excessive noise directions for a greater number of noise complaints. Excessive noise directions are issued where noise exceeds a 'reasonable level' as determined by the noise control officers.

Most noise complaints concern residential noise in residential areas.

The current noise complaint register does not record the reason for the complaint, for example noise from stereo or use of drums. However, most noise complaints are related to noisy parties and other loud noises in the residential area. It is interesting that most of the noise complaints are for

residential noise in residential areas. Council's District Plan objectives focus on the adverse effects of non-residential noise on residential areas.

The Council recorded only one noise complaint per year, between 1994 and 1998, which related to noise from the airport. The reason for the low level of complaints is probably due to compliance with the noise curfew, limiting aircraft movement between 10.30pm and 6.00am. One of Council's objectives for managing noise is to minimise the adverse effects of noise from the airport on amenity values. Surrounding residents are however, not complaining to Council about any adverse effects from the airport.

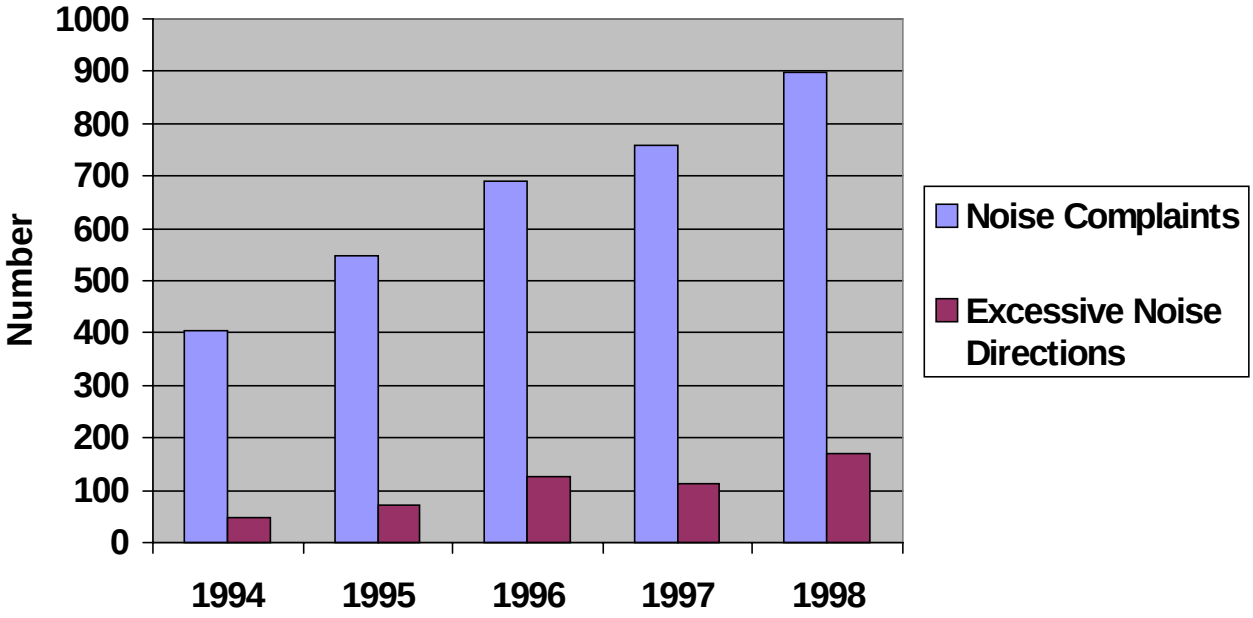

Figure 9.1. Total number of noise complaints and excessive noise directions issued between 1994 and 1998

Ambient Noise Levels

Council commissioned an Environmental Noise Report in May 1993. The information from this report was used to develop appropriate District Plan objectives, polices, rules and performance standards for Noise. The report also monitored background noise levels at 14 sites throughout the District, including rural and urban locations.

The key finding of the monitoring was that traffic noise was the key noise source responsible for elevated noise levels at the sites monitored.

Background noise levels were also relatively consistent between residential, rural and industrially zoned land. This is because the Kapiti Coast does not have any significant noisy

industries. Average nuisance noise levels (L10) for residential, rural and industrially zoned land are shown in Figures 9.2 and 9.3,

What is L10 dBA?
Nuisance sound levels (L10) are the sound levels that are equalled or exceeded for 10% of the measurement period when noise monitoring occurs. L10 correlates well with the subjective reaction to sound. Council's District Plan sets standards for maximum permissible noise levels for L10 sound levels.

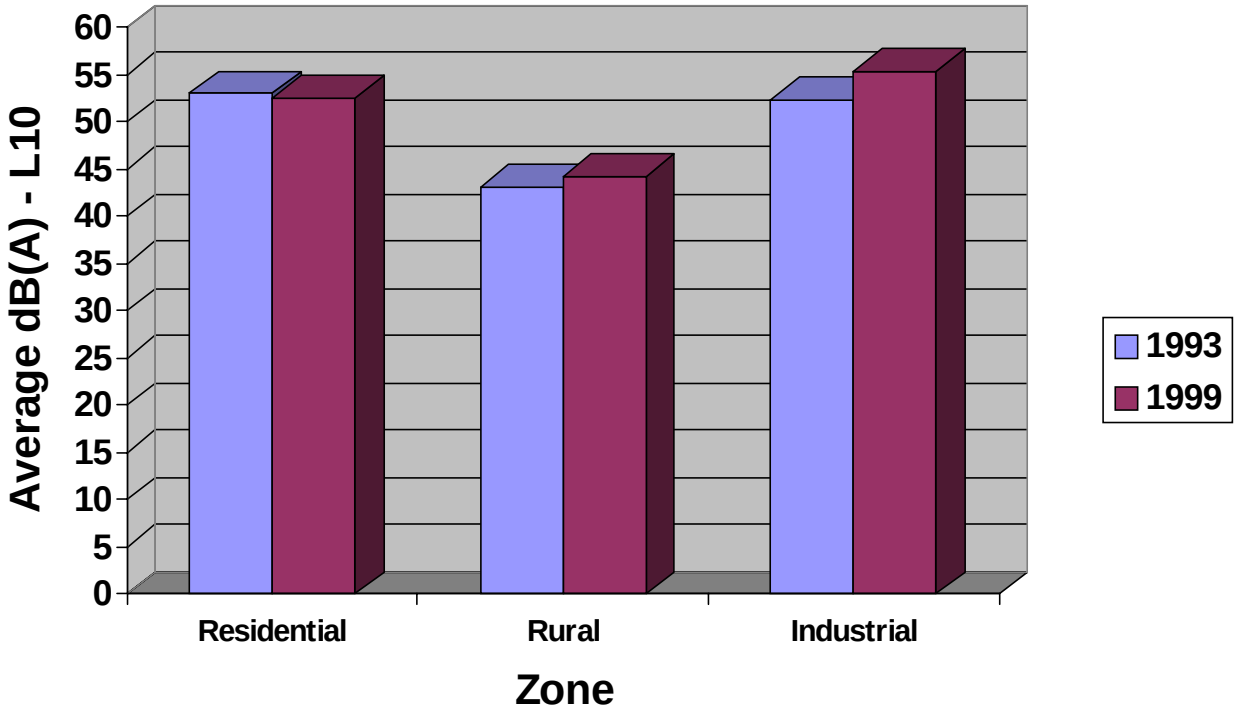

Figure 9.2. Average day-time nuisance noise levels

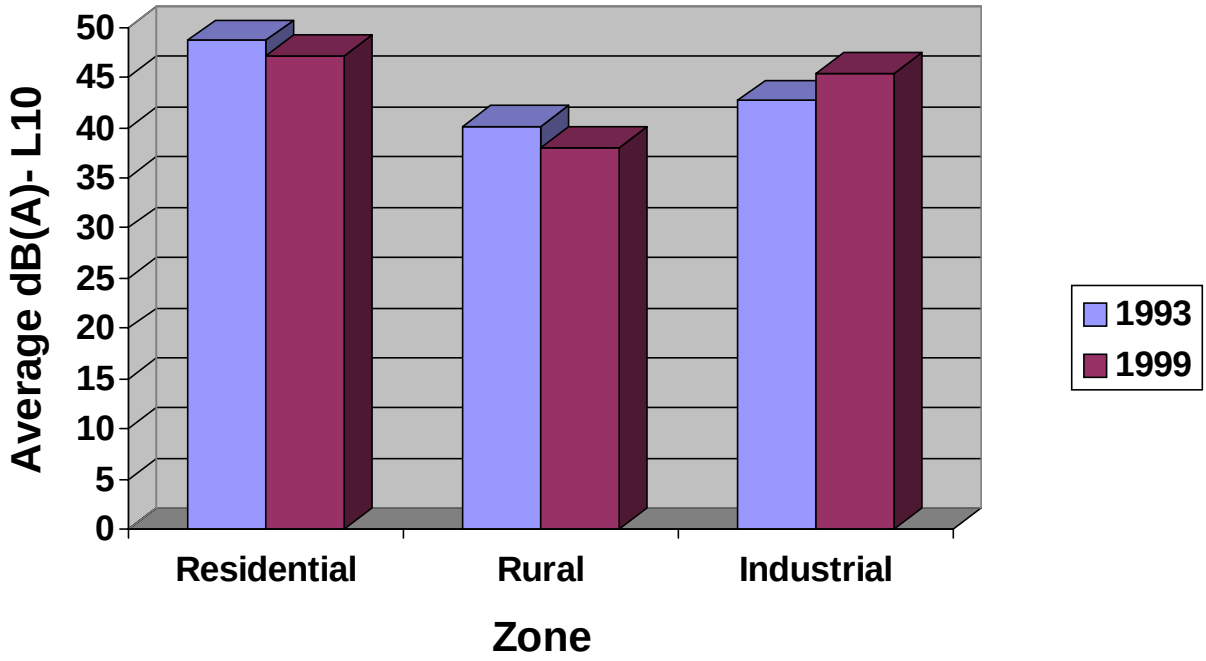

Figure 9.3. Average night-time nuisance noise levels

Council is undertaking more noise monitoring to see if levels have increased.

The Council commissioned an update of the 1993 Environmental Noise Report. Monitoring of the sites began in mid April 1999 and was completed in May 1999.

The monitoring results show that there is little change in nuisance noise levels in the residential area between 1993 and 1999. However, during this period there has been a significant increase in the number of noise complaints received by Council officers. This is indicative of a decreased tolerance for excessive noise, and an increase in awareness of the noise complaints service.

Traffic noise is still considered to be the most important determinant of ambient sound in the District.

Nuisance noise levels in the rural and industrially zoned parts of Kapiti have also remained relatively steady, with minor increases during the day in the rural areas. Noise levels in industrial areas have increased, while noise levels in residentially zoned areas have dropped slightly.

Comparison with District Plan standards

The Proposed District Plan sets noise level standards for activities on the Kapiti Coast, using L10. The 1999 Environmental Noise Survey indicates that, generally, the standards in the District Plan are being met. Noise at a residential boundary must not exceed 50 dBA (L10) between 7am to 10pm, and 45 dBA (L10) between 10pm and 7am.

Three of the noise monitoring sites in residential areas have noise levels higher than permitted in the plan. The higher levels are due to traffic noise, and are covered by higher noise standard in the standard for noise from transportation activities.

The District Plan standards are more stringent than those in the relevant New Zealand Standard NZS6802:1991. This standard sets maximum day-time noise levels of 55dBA(L10).

Comparison with other cities

The environmental noise monitoring results for the Kapiti have been compared with noise levels for two cities of similar size, Nelson and Porirua. A similar number of sites in the residential, industrial and rural zones have been monitored for each city. Figures 9.4 and 9.5 show the average day-time and night-time noise levels for Kapiti, Nelson and Porirua.

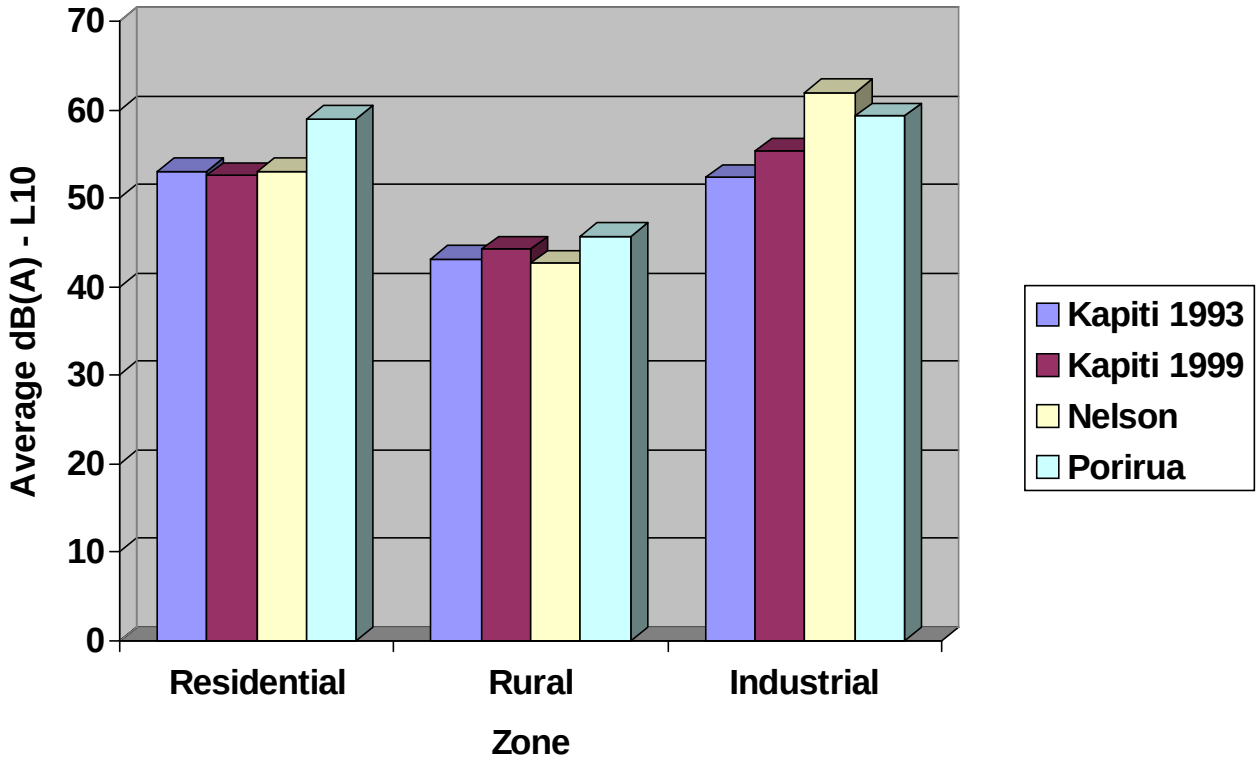

Figure 9.4. Comparison of average day time nuisance noise levels

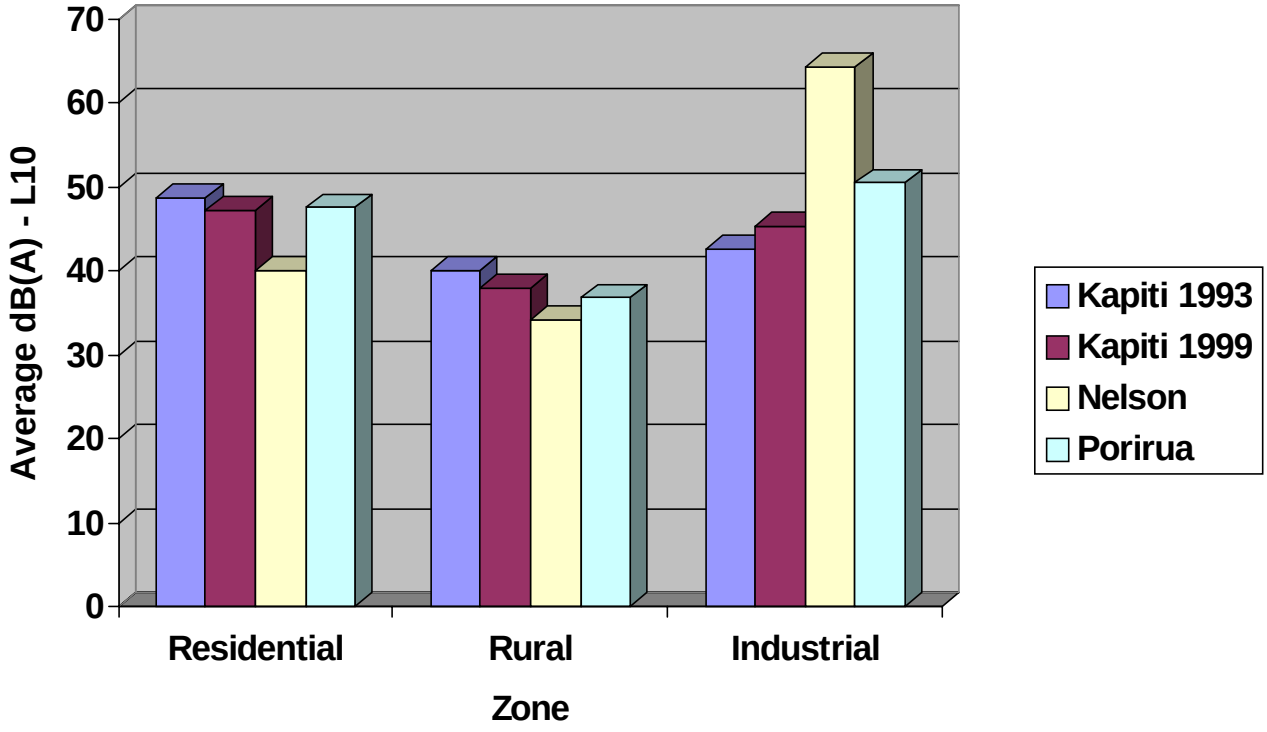

Figure 9.4. Comparison of average night-time nuisance noise levels

Noise levels in Kapiti, measured at residential, rural and industrial monitoring sites, compare well with noise levels in Nelson and Porirua, as they are generally lower. Comparisons between the three local authorities are hard to make without doing an in-depth analysis. However, some general principles can be determined.

Average residential noise levels for all three cities are almost always within the upper limits recommended in New Zealand Standard 6802:1991 for residential sites. In Nelson, Porirua and Kapiti Coast, traffic noise was found to be the major source of noise. The residential areas of Porirua have higher noise levels, due in part to close associations with busy traffic routes.

Nelson has higher noise level averages for industrial areas during the night. This is due to the measured levels affected by 24 hour activities related to fruit picking for at least 1 noise monitoring site.

Night and day time averages for Rural sites across Kapiti Coast, Nelson and Porirua are similar, associated with the typically quiet rural environment. Low noise levels during the day are due to the occasional cars passing by on rural roads.

Summary

Noise complaints		The number of noise complaints has increased by 122% between 1993 and 1998. Similarly the number of excessive noise directions issued by Council has also increased by 246%. The increase in excessive noise directions issued means more people are creating excessive noise, which has an adverse effect on amenity values and community health.
Monitoring noise levels		Council has established 14 noise monitoring sites throughout the District. Continued monitoring of these sites will help identify actual changes in noise levels. The second round of monitoring was completed in May 1999. The results show that noise levels remain relatively constant. There have been slight increases in noise levels in industrial areas. Noise in the residential areas is generally less than the noise standard set in the District Plan. Three sites have higher noise levels but are subject to higher noise standards for noise from transportation activities. Noise levels in Kapiti are generally less than noise levels in Nelson and Porirua, two similarly sized settlements.

What is the Council doing to manage noise

- *Continued monitoring of noise at 14 sites throughout the District.*
- *Recording noise complaints and issuing excessive noise directions where required.*
- *Imposing conditions limiting noise generation on relevant consents.*
- *Taking court action where excessive noise is not abated and continues over a period of time.*

What you can do to help

- *Be aware of the level of noise your activities generate, for example loud stereos or parties.*
- *Be considerate to neighbours.*
- *Advise the Council if noise is a problem.*

Who you can contact for further information

Environmental Health Offices at Kapiti Coast District Council on (04) 904 5874

References

- *Malcolm Hunt Associates (May 1993) Environment Noise Report for Kapiti Coast District Council – Survey Results and Recommendations for District Plan Noise Performance Standards. Wellington, New Zealand.*
- *Malcolm Hunt Associates (May 1999) 1999 Environmental Noise Survey Update for Kapiti Coast District Council. Wellington, New Zealand.*

10. Transport

Objective for managing transportation

- *To achieve a transport infrastructure that provides for the efficient and safe movement of people and goods throughout the District, and avoids, remedies or mitigates adverse effects of transport on the environment.*

Transportation on the Kapiti Coast

Transport in the District is dominated by road and rail, with a limited amount of commercial traffic through Paraparaumu Airport.

There is an integral relationship between the development of transport, land use and urban form.

State Highway 1 and the North Island Main Trunk Railway are the most significant elements of the transport network in Kapiti. There is an integral relationship between the development of transport, land use activities and urban form, with the main centres and communities in Kapiti developing along the transport routes. An effective transportation system is a key influence on the form and structure of further urban development.

The effect of transportation on the environment

Access to transport is vital for social, economic, cultural, recreational and other activities. However, the development of transport infrastructure can have significant adverse effects on the environment. Similarly, the effects of activities on development of transportation infrastructure can also be significant. Increasing traffic from adjoining land use affects the efficiency of a road by increasing travel times and congestion. Potential conflict between through traffic and vehicles entering and exiting vehicle accesses can increase accident rates.

Transport contributes to noise and air pollution, and is a major consumer of energy, for example petrol. Oil, petrol and chemicals from cars are washed into the stormwater system after rain. This is then discharged into the environment.

Increasing volumes of traffic can affect amenity values through increased noise. Traffic noise, particularly near arterial roads, is the most significant contributor to

background noise at the 14 noise monitoring stations established by the Council and the District.

New transport infrastructure can separate communities and decrease amenity values. It is important that the adverse effects of transportation are minimised as much as possible, while still ensuring that the community retains access.

Use of public transport, walking or cycling can reduce the environmental impacts of transportation.

Use of public transportation or walking or cycling, can reduce the adverse impacts of existing transport networks and reduce the need for more development. Both train and bus systems reduce the amount of pollution emitted into the atmosphere compared with cars and trucks. Reduced numbers of cars also reduces congestion at peak traffic times.

Key issues for transportation

- *Effects of transportation infrastructure on the environment and the community, including amenity values.*
- *Efficiency of transport routes through the District.*
- *Traffic safety.*

What we know about transportation on the Kapiti Coast

Table 10.1 presents a list of indicators we can use to monitor the effects of transportation.

Indicators for Monitoring Transportation	
Issue	**Indicators**
Effects of transportation infrastructure on the environment, community and amenity values.	• *Cost to community of traffic accidents.* • *Mode of transport to work.* • *Vehicle ownership.* • *Number of people using public transport.* • *Complaints about the roading network.*
Efficiency of transport routes through the District.	• *Traffic counts at peak times.* • *Network Statistics.*
Traffic safety.	• *Number of Traffic Accidents (Minor, Major, Fatal).* • *Crash rate.*

Table 10. 1

Effects on the environment, community and amenity

Accident Cost

The cost of road accidents to the Kapiti Coast community in 1997 was $40.52 million

The Land Transport Safety Authority (LTSA) has calculated the cost to society of traffic accidents in the District. During 1997 it was $40.52 million. This is made up of:

- *$9.09 million for urban local road crashes*
- *$1.52 million for rural local road crashes*
- *$2.38 million for urban state highway crashes*
- *$27.53 million for rural state highway crashes*

Mode of transport

The 1996 population and dwelling census recorded the mode of transport for people on census day in Kapiti. Of those people that travelled to work 12.6% used some form of public transport, walked or cycled to work. This is consistent with the national average of 14.2%, but lower than the Wellington Region average of 18.9%

The Community Profile Report (Development Trends Study) for the Kapiti Coast indicates that 32% of the Coast's working population commute to work, with over one fifth working in Wellington. Around 750 people commute into the District for work from outlying areas. The greatest number of commuters is found in the more southern urban areas, in Paekakariki, Raumati South and Raumati Beach, and Paraparaumu Beach South.

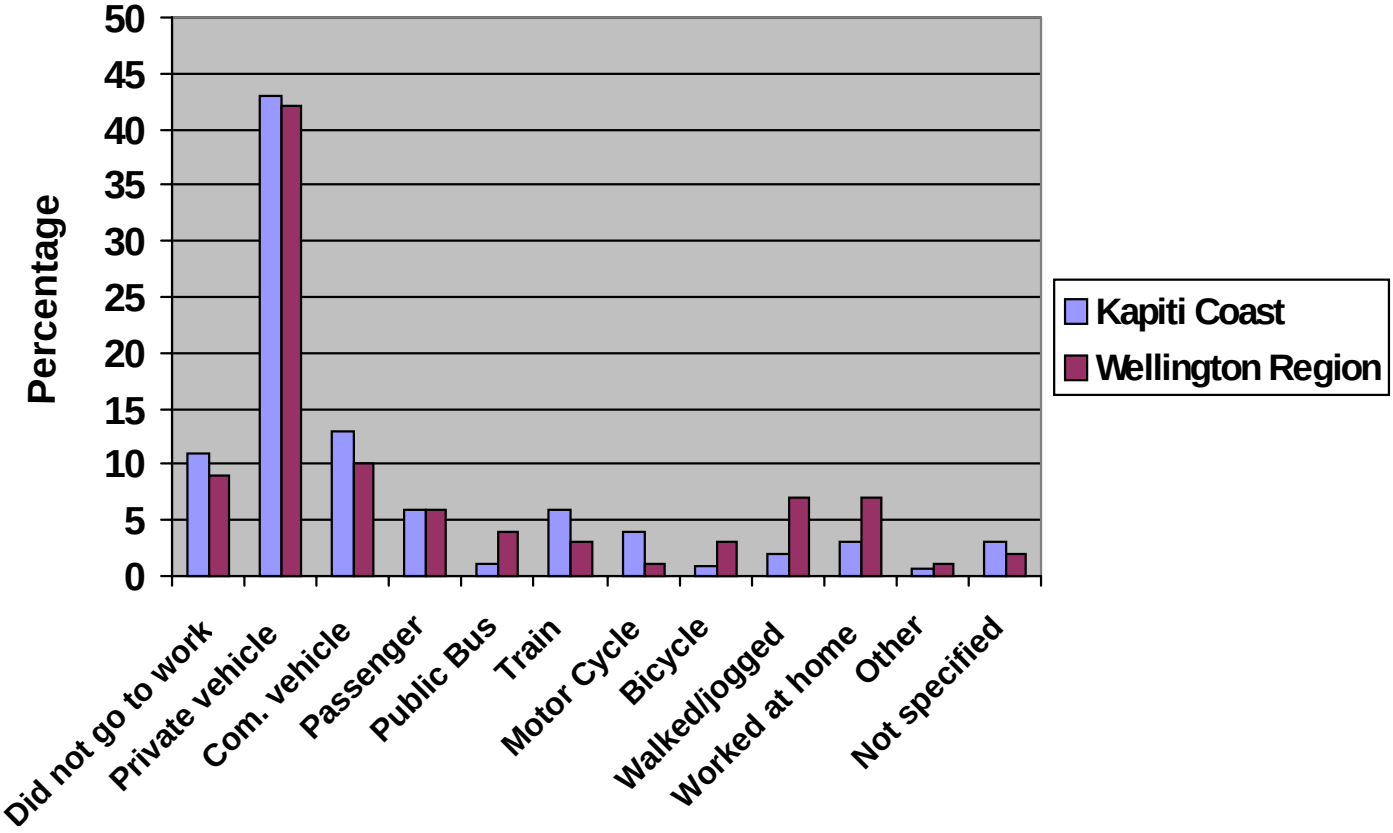

Figure 10.1: mode of transport to work

Vehicle ownership

The 1996 census recorded 13,029 households in the District with at least one vehicle. In 1996, there were 38,583 people resident. This means 33 out of every 100 people owns a vehicle. This number is likely to be under-represented as the census only covers vehicles in private dwellings, not those owned by companies. The National State of the Environment Report, released by MfE in 1997, determined that, on average, 69 out of every 100 New Zealanders owned a motorised vehicle.

Public transport

Kapiti Coast District Council does not have a direct role in the provision of public transport but does have an advocacy role with Wellington Regional Council. The Council undertakes the development of carparks and bus shelter maintenance on behalf of Wellington Regional Council, to facilitate continuing use public transport.

Walkways, cycleways and trams

There are approximately 60 kilometres of public walkways in the District. *(refer to Chapter 4 – Open Space and Reserves for more information).* The Regional Council also provides for

cycle ways, bridle paths and a tramway at Queen Elizabeth Park. The cycle way covers main routes through most of the urban centres in the District, and provides an alternative means of transport, other than by car.

Complaints/requests about the roading network

The Council receives approximately 24,000 complaints and requests about the road network each year. This represents 62 complaints or requests for every 100 people in the District. Council does not keep records of the nature of complaints or requests due to the sheer volume, but they range from requests for roads to be sealed to complaints about potholes.

Traffic Safety

Accident Rates

Traffic accidents are increasing both on local roads and the State Highway

Accident rates for all roads in the District are shown in Figures 10.1 and 10.2. The severity of a crash is determined as the most severely injured casualty in the crash. Traffic accidents are increasing on both local roads and State Highway 1.

Non-injury accidents do not have to be reported to the Police. The LTSA considers that only one 1 in 14 non-injury accidents are reported. The increase in reported non-injury accidents could be attributed to an increased level of reporting.

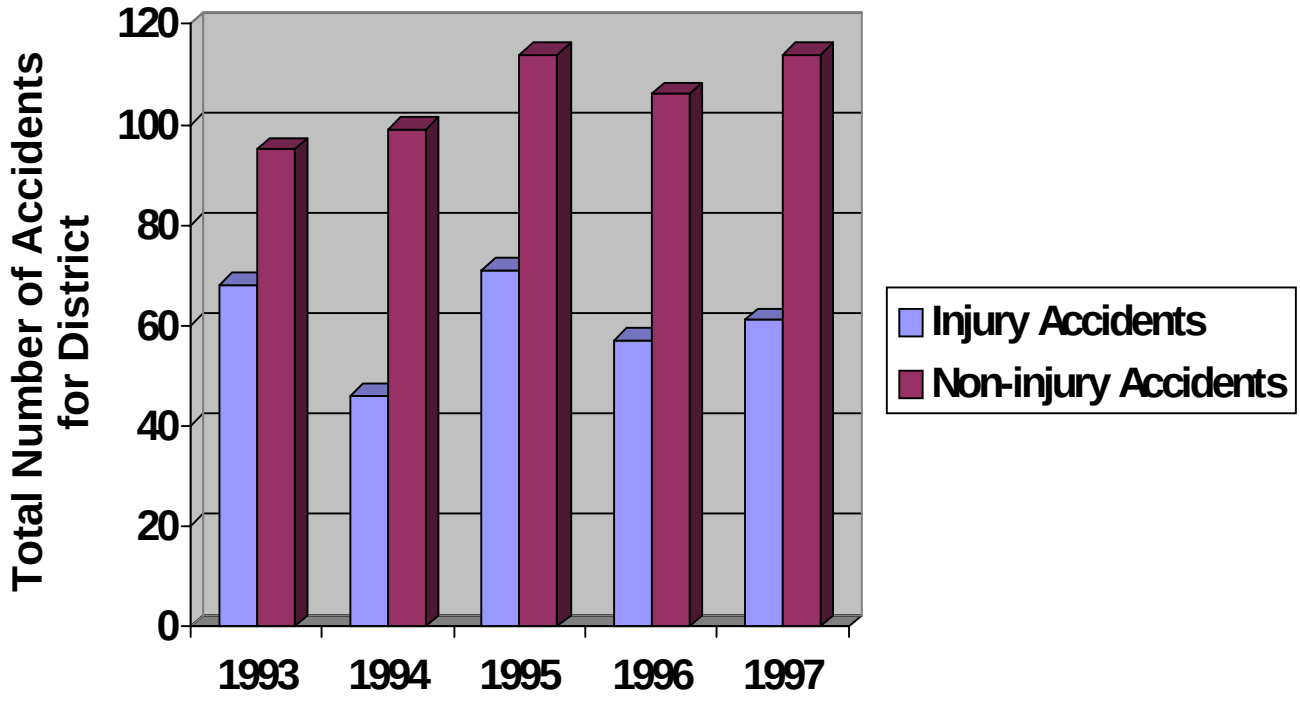

Figure 10.2. Total number of accidents on State Highway 1 (1993-1997)

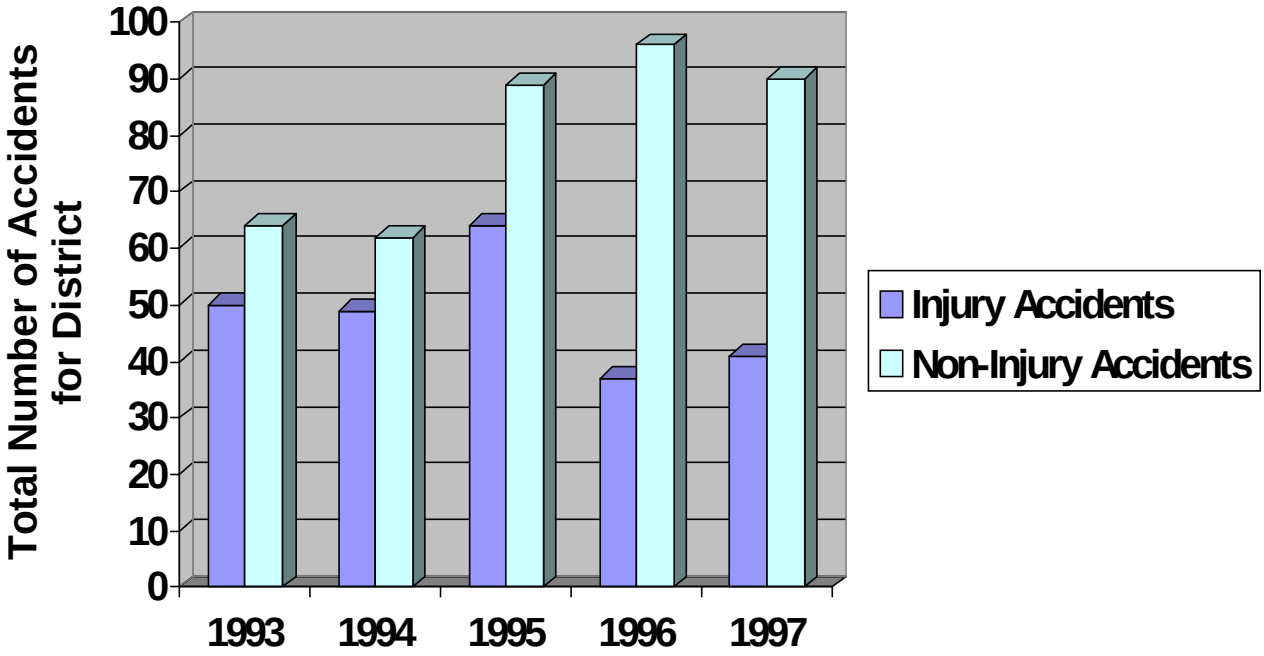

Figure 10.3. Total number of accidents on local roads (1993-1997)

Crash Rate

A useful figure for measuring personal safety is the crash rate per 10,000 people. The crash rate for Kapiti Coast District Council in 1997 was approximately 26 crashes per 10,000 people. This is slightly higher than the national average of 25 per 10,000 people. Overall, there has been a reduction in the number of crashes, which appears to indicate that road safety campaigns are working. The crash rate on the Kapiti Coast has remained relatively consistent with the national rate over the past seven years.

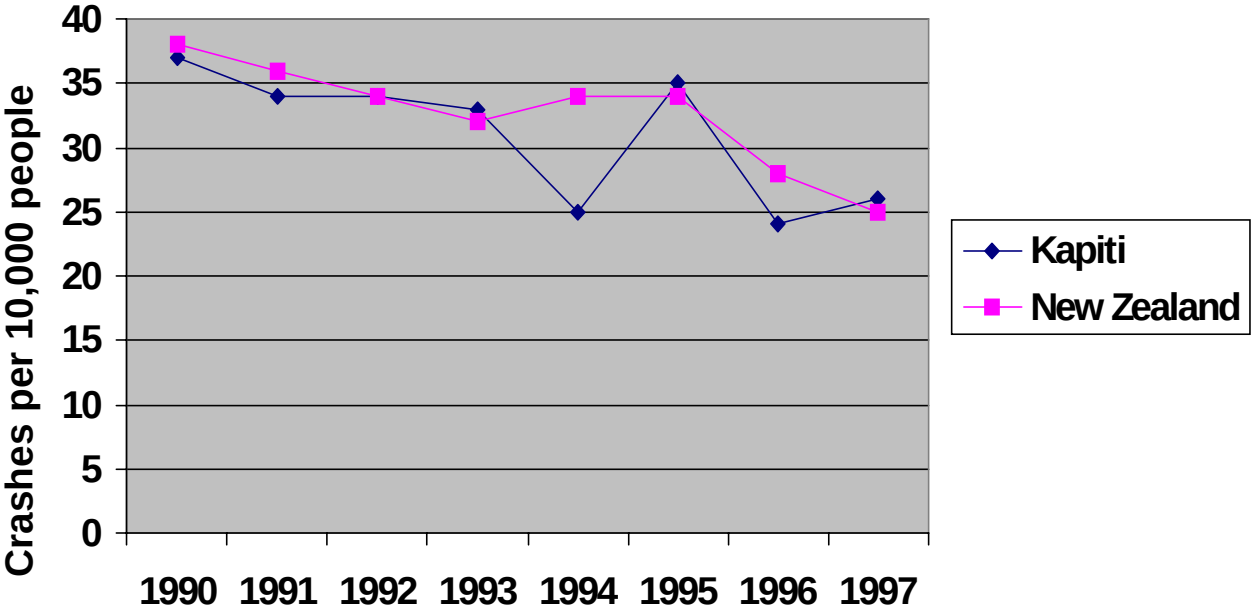

Figure 10.4. Number of Crashes per 10,000 people – Kapiti Coast versus New Zealand

Network Efficiency

Traffic Counts

Vehicle numbers on the District roads are increasing.

Vehicle numbers on roads in the District are increasing. Annual average daily traffic (AADT) counts for 1992 – 1997 on State Highway 1 show that much of the traffic increase is occurring within the Kapiti Coast District.

The increase in vehicle numbers, both local and on the State Highway, means that the adverse effects of transportation may also increase. More cars on the road results in increased congestion, especially at peak times, and an increase in traffic noise. Traffic noise is the greatest contributor to high background noise levels in residential areas. *(refer to Chapter 9 – Noise, for more information).*

Higher traffic volumes means increased effects on the environment.

Higher traffic volumes also increases the discharge of contaminants from car exhausts, especially when cars must engage in "start-stop" manoeuvres. Wellington Regional Council is responsible for managing air quality, including the effects of discharge of contaminants from transportation.

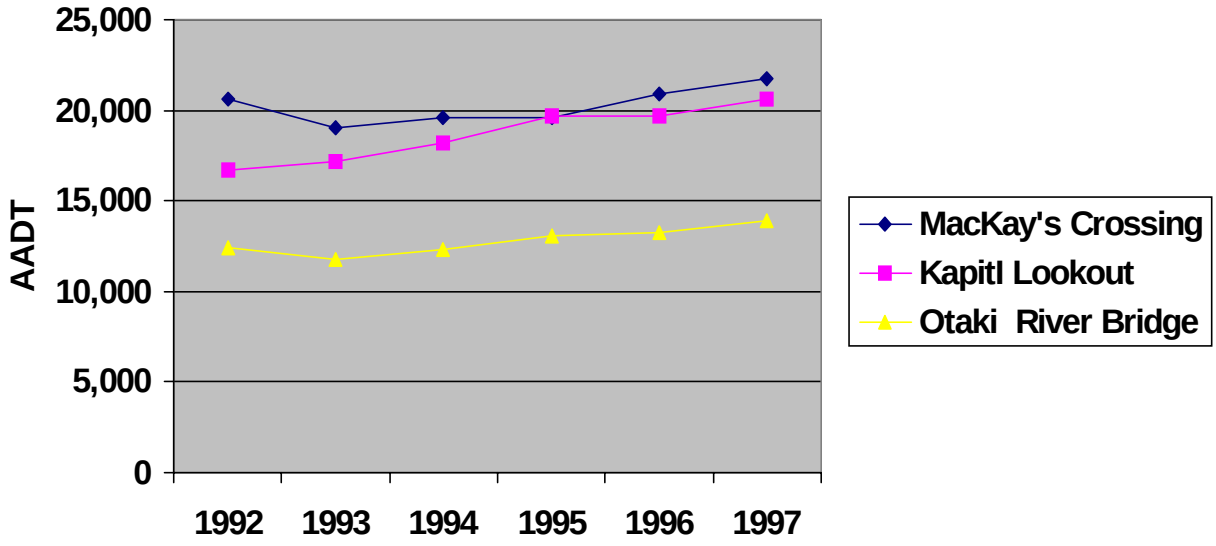

Figure 10.5. Traffic Volumes on State Highway 1 (1992-1997)

Length of Road

Council maintains over 300 km of road each year.

Kapiti Coast has 357km of road, 20km of which is unsealed. The District has had a small increase of 5% in road length since 1995/1996, most of which is associated with new development in the District. The Council has a programme in place to continue sealing unsealed roads, and has sealed 4.6

km of roads in the past three years.

A reduction in the length of unsealed road contributes to a decrease in dust nuisance from gravel roads.

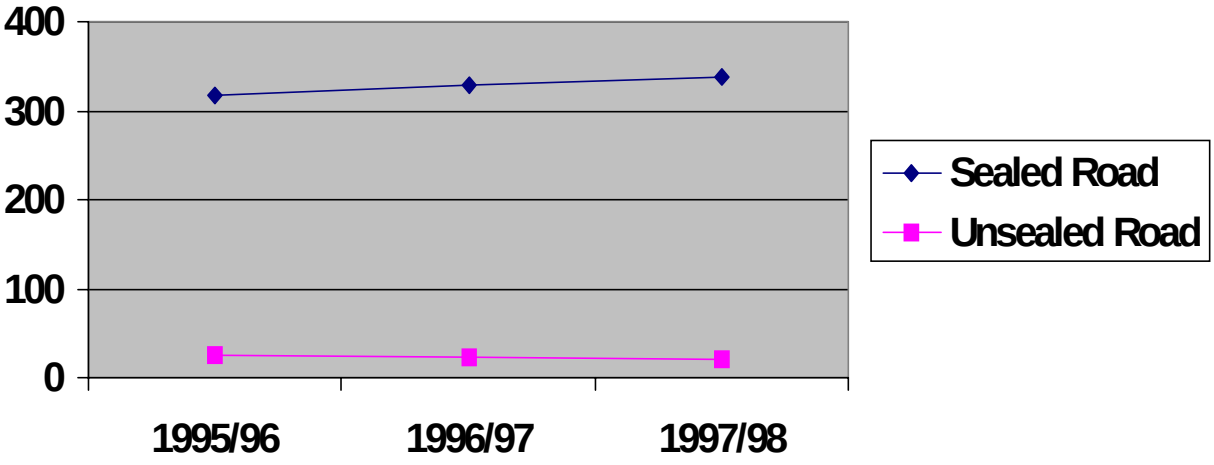

Figure 10.6. Length of sealed and unsealed road (kms) in the Kapiti Coast District

Continued Growth of Roading Network

The existing road network needs developing to cater for predicted growth in population.

Council commissioned a roading network study in 1996 to examine the status of the District's roading network. The rapid population growth means that the existing roading network is inadequate for both the current volume of traffic and the continuing anticipated growth and development.

The roading network study sets the framework for identifying which new arterial roads will be built by Council, while sub-arterial roads will be predominantly built by developers. A road hierarchy is included in the District Plan, which is used to determine priorities for new roads as well as determining the route of roads built as a result of subdivision . The Western Link Road is the major arterial road proposed. It will form an alternative route to the State Highway One through the District and reduce traffic congestion on the State Highway.

Summary

Traffic Safety		The total number of accidents on both local roads and State Highway One remains steady. The number of injury accidents is increasing. The crash rate per 10,000 people is comparable with the national average.
Environmental Effects of Transport		Kapiti Coast is comparable to the rest of New Zealand for use of public transport.
Transport Efficiency		Council is continuing to seal gravel roads, which reduces dust nuisances, and removes the need for the use of dust suppressants.

What is the Council doing to manage transportation

Council is investigating its options to address the problem of traffic congestion on the State Highway.

- *Continuing to apply for funding from the New Zealand Road Safety Programme to fund community safety projects.*
- *Designating the Western Link road as a new arterial designed to reduce local traffic congestion on State Highway One.*
- *Building new roads or extensions to existing roads to improve the road network of the District.*
- *Continuing to upgrade existing roads as part of an on-going programme*

What you can do to help

- *Use public transport, walk or cycle where possible to reduce congestion on arterial roads*

Who you can contact for further information

Operations Engineer – Kapiti Coast District Council (04) 904 5853

References

- *APR Consultants (1997) Kapiti Coast District Leisure Plan (Stage II) – prepared for Kapiti Coast District Council, Wellington, New Zealand.*

- *Land Transport Safety Authority (1998) Road Safety Report – Kapiti Coast District 1993-1997, Wellington, New Zealand.*
- *Ministry for the Environment (1997) State of New Zealand's Environment, Wellington, New Zealand.*