



# ENVIRONMENTAL MANAGEMENT GROUP

## Technical report

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SAFEGUARDING YOUR ENVIRONMENT + KAITIAKI TUKU IHO

### **Mohaka, Waikari and Waihua Rivers**

An inventory of current  
knowledge of natural  
resources within the  
Ngati Pahauwera Rohe

July 2010  
EMT 10/18  
HBRC Plan No. 4200



## **Environmental Management Group Technical Report**

**Environmental Science**

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# **Mohaka, Waikari and Waihua River Catchments. An inventory of current knowledge of natural resources.**

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**July 2010  
EMT 10/18  
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## EXECUTIVE SUMMARY

The Crown by way of its letter to Ngati Pahauwera dated 20 August 2008 has offered a “good governance initiative which would involve a scoping study on the health of the Mohaka, Waihua and Waikari Rivers, and a fund to contribute to the implementation of recommendations from that study.”

The purpose of this report is to provide an inventory of current knowledge of natural resources of the Mohaka, Waihua and Waikari Rivers that fall within the rohe of Ngati Pahauwera. To this end the geographical extent of the inventory includes the lower Mohaka River – the main stem and all tributaries from the Te Hoe catchment downstream, the Waihua and Waikari Rivers. Where appropriate the report also extends upstream to include the entire Mohaka River catchment.

This scoping study comprises a multi disciplinary input from various personnel of the Hawke’s Bay Regional Council and the Ngati Pahauwera Trust.

After discussions and briefs received from the working party, the following gaps in knowledge have been identified.

Water quality – Good records exist for the Mohaka main stem for Willowflat and Raupunga however no information exists for the Te Hoe River. Information for the Waihua River is largely historical and would need the recommencement of monitoring to be made more up to date.

Ecology - Riparian vegetation extent has been examined in combination with surrounding land use categories to gain a general understanding of likely effects on water quality and ecology of the rivers. This analysis was based on the LCDB2 geographic information systems database (defined in more detail in the body of the report). The current LCDB2 database gave an accurate depiction of conditions up to 2004. A more recent version of the database is not available. Fish population data is stored in the New Zealand Freshwater Fish Database however this data predominantly provides presence/absence data only and would not be considered reliable in determining the health of fish populations. More extensive fish monitoring surveys would be required to determine the age structure of fish populations and assess their abundance and viability. Macroinvertebrate surveys need to be undertaken in the Waihua and Te Hoe catchments to gain a better understanding of ecosystem health of these catchments.

Cultural values – the cultural health of the catchments is poorly understood. Methods to assess cultural health of the catchments are briefly discussed. There is a clear knowledge gap of these catchments with respect to cultural values.

Hydrology – hydrological records for the catchments are sparse however two hydrology sites (Mohaka River at Raupunga and Tahekenui Stream at Glenstrae) are maintained by NIWA for which reliable river flow records are available. In order to have a good understanding of flows within the Mohaka, Waihua and Waikari River catchments, it is recommended that a further 3 permanent recorder sites be installed as well as a concurrent gauging programme to develop correlations with existing gauging stations. Rainfall runoff modelling would also help improve our understanding of the hydrological character of the catchment.

Biosecurity – the Maungaharuru Ecological District has the greatest terrestrial ecology value of the rohe and this is where intensive animal and plant control is focused by DOC in the scenic reserves that are scattered amongst the Mohaka, Waihua and Waikari Catchments. Animal pest control by Regional Council is largely confined to possums for the protection of animal health from bovine tuberculosis. While this measure is effective in protecting animal health, it is not effective in protecting biodiversity. In terms of plant pest control there are only two locations that are targeted for control of old man’s beard (Mohaka and Waikari Catchments). Areas where plant pest control is not occurring are also identified.

Land use pressures – other than general classifications of land use (e.g. Pastoral farming, plantation forestry, indigenous forest etc) little is understood in terms of localised land use

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pressures. It is possible that there are areas within these catchments that are subject to differing stocking rates, sheep/beef ratios and forestry planting densities. This is a recognised knowledge gap. Land use maps are provided and high risk slip areas identified. Erosion control plans have been scant and not well documented. However GIS capabilities are outlined on what is achievable to increase our understanding of land use pressures on conservation, ecology and water quality values. Commercial tourism activities within the catchments are summarised to gain an understanding of other economic values besides farming.

Geological influences – No specific earthquake information is held by Hawke's Bay Regional Council for these rivers however small scale geological maps show active fault traces crossing the rivers. The Ruahine and Mohaka faults are the major active faults of the region. Ground shaking and liquefaction hazards within the catchments are outlined. Tsunami risks along the coast are also commented upon.

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## 1.0 INTRODUCTION

The Crown by way of its letter to Ngati Pahauwera dated 20 August 2008 has offered a “good governance initiative which would involve a scoping study on the health of the Mohaka, Waihua and Waikari Rivers, and a fund to contribute to the implementation of recommendations from that study.”

This report provides an inventory of current knowledge of natural resources within the Mohaka, Waihua and Waikari Rivers that fall within the rohe of Ngati Pahauwera and seeks to address the terms of reference sought by the Ngati Pahauwera Trust 2009. In some instances entire catchment information has been reported to give context to cumulative effects however it should be noted that the geographical extent of the rohe of Ngati Pahauwera includes the lower Mohaka River – the main stem and all tributaries from the Te Hoe catchment downstream; the Waihua River and the Waikari River.

This scoping study comprises a multi disciplinary input from various personnel of the Hawke’s Bay Regional Council and the Ngati Pahauwera Trust. Where gaps in knowledge are identified an estimate of what is required to address the gap is provided.

Key personnel selected for input include

- GIS mapping and statistics of catchment boundaries and land use - Darrel Hall
- Commercial uses within the catchments - Janet Takarangi –
- Water quality and benthic ecology – Brett Stansfield
- Riparian vegetation extent and general land use– Fiona Cameron
- Cultural values and health – Ngati Pahauwera Trust (Toro Waaka, Kuki Green, Charles Lambert, Gerald Aranui, Arthur Gemmell, Sissiel Henderson and Tureiti Moxon)
- Extraction of river resources – Graham Hansen, Arthur Gemmell
- River flows – Rob Waldron
- Land use pressures – Pete Manson, Darrel Hall
- Plant pests – Darren Underhill
- Animal pests – Owen Harris
- Geological influences- Lisa Pearse

The chapters that follow provide an inventory of what is currently known about these topics and what information is needed (if any) to strengthen existing knowledge.

The report is divided into 5 chapters comprising

- Chapter 1 – introduction providing the purpose and terms of reference of the study and to outline the geographical extent of the study.
- Chapter 2 – outlines the current land uses occurring within the catchment including commercial uses (tourism, fishing).
- Chapter 3 – a summary of the health of the rivers is presented. Information includes water quality, ecology, what is known of the fishery, riparian vegetation extent, and hydrology. Cultural health of the rivers are also investigated.
- Chapter 4 – threats to the rivers. This chapter outlines what is known of land use pressures within the catchments and what is known of extraction of natural resources from the river catchments. Natural hazards and bio security risks to the catchments are also summarised.
- Chapter 5 – provides a bibliographic listing of all literature cited throughout the document. The listing has been produced as a quick guide of where to find further information by topic.

### 1.1 Geographical Extent of this Study

The geographical extent of the Ngati Pahauwera Rohe is defined as the Waihua and Waikari Catchments and the lower Mohaka Catchment (defined by all tributaries downstream and inclusive of the Te Hoe River



Figure 1: Geographical extent of Ngati Pahauwera Rohe

## 2.0 CURRENT LAND USES WITHIN THE CATCHMENTS

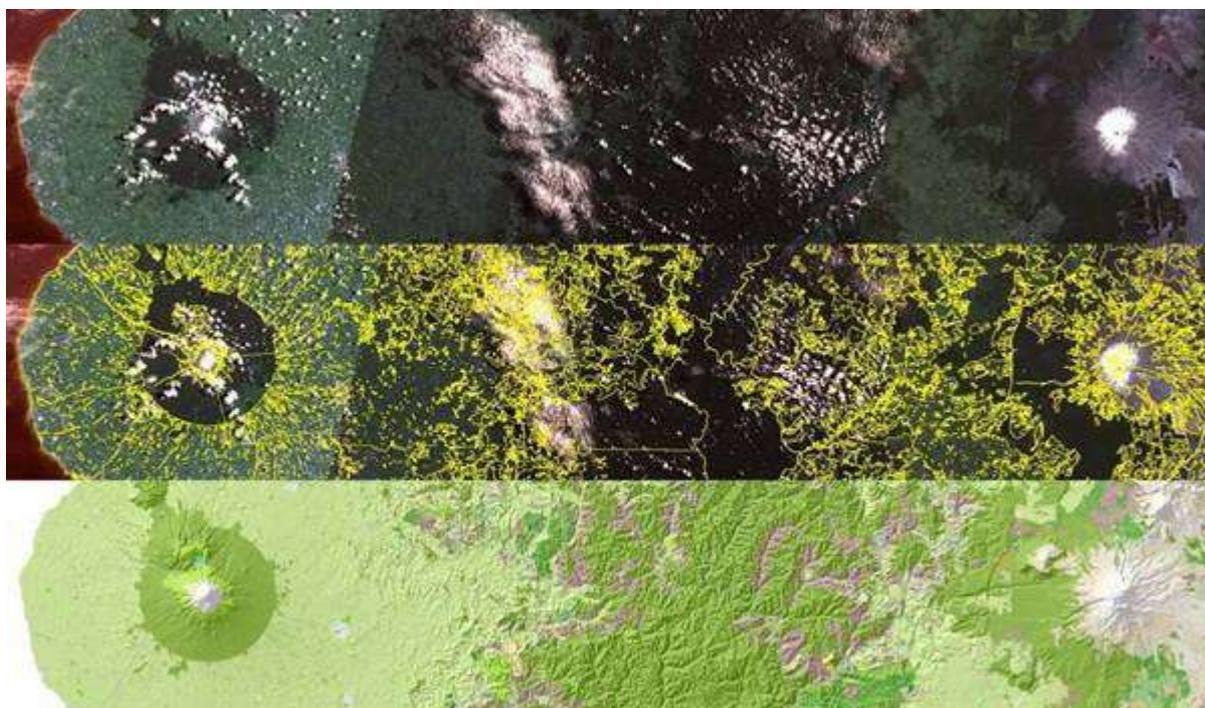
The current land uses within the catchments comprise pastoral farming, production forestry and indigenous forest. Summary statistics produced from the GIS mapping show that the Te Hoe Catchment is predominantly indigenous forest while the Waikari and Waihua catchments are predominantly in pastoral farming. The summary statistics for each catchment are outlined in Table 1.

### 2.1 Introduction to the New Zealand Land Cover Database

The New Zealand land cover database (LCDB2) is a Crown database of which the Ministry for the Environment, Ministry of Agriculture and Forestry, and Department of Conservation are the key stakeholders. The LCDB2 is a representation of land cover for the New Zealand mainland, near-shore islands and Chatham Islands circa summer 2001 and was released in July 2004. It is a thematic classification of 43 land cover and land use classes.

The following information describing the LDCB has been taken from the Ministry for the Environment website (<http://www.mfe.govt.nz/issues/land/land-cover-dbase/>) -

The New Zealand Land Cover Database (LCDB) is a digital map of the land surface of the country. It is created by grouping together similar classes which can be identified in satellite images. Being digital, it can be used to make a number of different maps. As a map, it can be combined with other geographic information to reveal new information on patterns and trends of land use and land cover. The Land Cover Database version 2 (LCDB2) contains snapshots of land cover as of 1996-97 and 2001-02 incorporated into the data layer. It provides the basis for better resource management decisions, more effective use of natural resources and improved environmental management.



The Land Cover Database begins with a satellite image (top). Polygons define the edges of similar land cover types (middle). Polygons are assigned LCDB values and stored in a spatial database for mapping (bottom).

Positional accuracy of the data conforms to Land Information New Zealand's 1:50000 topographic data standard with a minimum mapping unit (MMU) of one hectare (ha).

LCDB2 is intended to be used in areas such as state of the environment monitoring, forest and shrub land inventory, biodiversity assessment, trend analysis and infrastructure planning (Thomson et al, 2003).

Some examples of uses for the database are:

- To show and monitor the extent of native and exotic forests, pastureland, wetlands, coastal sand dunes and urban land that are present throughout New Zealand.
- To identify changes in vegetation in areas that are vulnerable to erosion or fire.
- To monitor changes in land use, for example, between farming and forestry.

The LCDB2 database represents the most up to date information for assessing broad scale land use patterns across the Hawke's Bay region. Options for updating this information to the current date are limited and would involve extensive, specialised analysis and ground-truthing of aerial photographs or similar media.

For further information on the New Zealand Land Cover Data base refer to the MfE website:

<http://www.mfe.govt.nz/issues/land/land-cover-dbase/>

## 2.2 Land cover of the Mohaka, Waikari and Waihua catchments.

A desktop exercise was conducted to determine the proportions of differing land cover classes using the LCDB2 database within the catchments of the Mohaka, Waikari and Waihua rivers. By looking at the extent of differing land cover classes it gives us an understanding of the level of protection, through buffering, on the streams and rivers from overland diffuse source discharges of nutrients and sediment inputs. Using Arc Map, the river catchments layer was overlaid with the land cover layer (LCDB2) to determine the land cover classes at a catchment scale.

A 30m buffer was applied to the rivers and streams within the specified catchments to determine the extent of riparian vegetation. Proportions of each of the land cover classes within this 30m buffer area were calculated.

## 2.3 Catchment Scale.

The following analyses focus on entire river catchments to give context to cumulative land cover and use impacts on river ecosystems.

The Mohaka catchment is 242,882 Ha in size. Results of the GIS analysis show that the Mohaka has the greatest proportion of indigenous forest (50.1%) within the catchment covering an area of 122892 Ha (Table 1). The Waikari and Waihua catchments cover a considerably smaller area (42,324Ha and 16,810Ha respectively). In comparison, the Waihua and the Waikari only have 0.85% and 4.18% respectively of indigenous forest within their catchment boundaries. The largest land cover class within the Waikari and Waihua river catchments is high producing exotic grassland indicating that there is a higher potential for input of contaminants and nutrients into the Waikari and Waihua river systems and as a consequence, a higher potential for degraded water quality and ecology.

LCDB2NAME	MAINCAT Data						Total Sum of HECTAR	Total Sum of percent
	Mohaka		Waihua		Waikari			
	Sum of HECTAR	Sum of percent	Sum of HECTAR	Sum of percent	Sum of HECTAR	Sum of percent		
Afforestation (imaged, post LCDB 1)	771.01	0.32	17.42	0.10	259.01	0.61	1047.44	1.03
Afforestation (not imaged)	1474.28	0.60	19.99	0.12	839.37	1.98	2333.64	2.70
Alpine Gravel and Rock	276.33	0.11					276.33	0.11
Broadleaved Indigenous Hardwoods	4750.90	1.94	654.50	3.87	399.71	0.94	5805.11	6.76
Built-up Area	4.31	0.00					4.31	0.00
Coastal Sand and Gravel					44.39	0.10	44.39	0.10
Deciduous Hardwoods	156.49	0.06	35.25	0.21	160.30	0.38	352.04	0.65
Fernland	129.17	0.05					129.17	0.05
Forest Harvested	4194.69	1.72	86.28	0.51	2109.93	4.97	6390.90	7.19
Gorse and Broom	1952.28	0.80	39.26	0.23	241.46	0.57	2233.00	1.60
Grey Scrub			36.55	0.22			36.55	0.22
Herbaceous Freshwater Vegetation	35.25	0.01	1.10	0.01			36.35	0.02
High Producing Exotic Grassland	31817.59	13.02	8418.43	49.80	25076.10	59.03	65312.12	121.85
Indigenous Forest	122892.29	50.29	143.73	0.85	1775.03	4.18	124811.05	55.32
Lake and Pond	22.04	0.01	6.20	0.04	6.56	0.02	34.80	0.06
Landslide	98.15	0.04	0.63	0.00	66.31	0.16	165.09	0.20
Low Producing Grassland	4442.65	1.82	601.13	3.56	1563.58	3.68	6607.36	9.05
Major Shelterbelts	99.46	0.04			12.66	0.03	112.12	0.07
Manuka and or Kanuka	32179.14	13.17	2571.89	15.22	1345.97	3.17	36097.00	31.55
Mixed Exotic Shrubland	42.63	0.02					42.63	0.02
Other Exotic Forest	582.07	0.24	6.87	0.04	109.48	0.26	698.42	0.54
Pine Forest - Closed Canopy	28201.57	11.54	3031.64	17.94	5656.14	13.31	36889.35	42.79
Pine Forest - Open Canopy	6496.62	2.66	1124.82	6.65	2642.60	6.22	10264.04	15.53
River	777.76	0.32	14.43	0.09	16.20	0.04	808.39	0.44
River and Lakeshore Gravel and Rock	202.52	0.08					202.52	0.08
Short-rotation Cropland	286.66	0.12					286.66	0.12
Sub Alpine Shrubland	71.24	0.03					71.24	0.03
Surface Mine	8.82	0.00					8.82	0.00
Tall Tussock Grassland	744.84	0.30					744.84	0.30
Transport Infrastructure	44.57	0.02					44.57	0.02
Vineyard	127.10	0.05					127.10	0.05
<b>Grand Total</b>	<b>242882.43</b>	<b>99.39</b>	<b>16810.12</b>	<b>99.45</b>	<b>42324.80</b>	<b>99.63</b>	<b>302017.35</b>	<b>298.47</b>

**Table 1. Land cover class summaries of each of the Mohaka, Waikari and Waihua river catchments in their entirety**

## 2.4 Riparian Scale.

By looking at the type of land-cover classes and the extent of the riparian vegetation within a 30m buffer of the rivers and streams, we are able to determine the potential of the riparian vegetation to act as a buffer against the input of nutrients and sediments to the rivers and streams. The buffer has been applied to all streams that have a stream order from 1<sup>st</sup> order streams upwards. This is most important as 1<sup>st</sup> and 2<sup>nd</sup> order streams are very small and likely to be most sensitive to surrounding land use impacts. The following diagram illustrates how stream order is determined.



A second order stream results from the joining of two first order streams. A third order stream results from the joining of two second order streams. A fourth order stream results from the joining of two third order streams, and so on and so forth.

The following analyses of the 30m riparian buffer focus on entire river catchments and include all stream orders to give context to cumulative land cover and land use impacts on river ecosystems.

### 2.4.1 Waihua Catchment

The analysis of the land-cover classes within the 30m buffer of the rivers and streams in the Waihua Catchment indicates that there is very little protection of the river from the input of nutrients and sediments (see Table 2). Indigenous forest is present in small sections of individual streams and amounts to 1.15% of the land-cover types within the buffer. The main proportion of land cover within the catchment is high production grassland (46%) indicating that at least 46% of the riparian margins within the catchment are unplanted and unprotected from potential contaminant inputs.

LCDB2NAME	Total Hectares	Percent (%)
Afforestation (not imaged) <sup>1</sup>	1.26	0.04
Broadleaved Indigenous Hardwoods	115.25	3.53
Deciduous Hardwoods	4.3	0.13
Forest Harvested	18.89	0.58
Gorse and Broom	9.01	0.28
Grey Scrub	4.26	0.13
Herbaceous Freshwater Vegetation	0.8	0.02
High Producing Exotic Grassland	1503.01	46.03
Indigenous Forest	37.57	1.15
Landslide	0.5	0.02
Low Producing Grassland	91.31	2.80
Manuka and or Kanuka	701.21	21.48
Other Exotic Forest	2.67	0.08
Pine Forest - Closed Canopy	564.52	17.29
Pine Forest - Open Canopy	201.67	6.18
River	4.04	0.12
Grand Total	3265.06	100

**Table 2: Land cover classes within the Waihua catchment 30m buffer**

<sup>1</sup> Not imaged = not visible in satellite imagery, but identified during the field-checking phase.

## 2.4.2 Waikari Catchment

The analysis of the land-cover classes within the 30m buffer of the rivers and streams in the Waikari Catchment again indicates that there is very little protection of the river from the input of nutrients and sediments (Table 3). Some pockets of indigenous forest are present in the Boundary Stream Reserve. This and surrounding small fragments in the upper Waikari amount to 4.67% of the land-cover types within the buffer. The main proportion of land cover within the catchment is high production grassland (56%) indicating that at least 56% of the riparian margins within the catchment have minimal protection from potential contaminant inputs.

LCDB2NAME	Total Hectares	Percent (%)
Afforestation (imaged, post LCDB 1) <sup>2</sup>	34.66	0.48
Afforestation (not imaged) <sup>3</sup>	143.79	2.00
Broadleaved Indigenous Hardwoods	113.36	1.58
Coastal Sand and Gravel	0.44	0.01
Deciduous Hardwoods	52.45	0.73
Forest Harvested	409.97	5.70
Gorse and Broom	75.32	1.05
High Producing Exotic Grassland	4058.58	56.46
Indigenous Forest	336.03	4.67
Low Producing Grassland	215.58	3.00
Major Shelterbelts	0.31	0.00
Manuka and or Kanuka	369.43	5.14
Other Exotic Forest	24.94	0.35
Pine Forest - Closed Canopy	996.88	13.87
Pine Forest - Open Canopy	336.61	4.68
River	15.02	0.21
Grand Total	7187.95	100

**Table 3: Land cover classes within the Waikari catchment 30m buffer**

<sup>2</sup> Imaged post LCDB1 = forest visible in the imagery and located on sites recorded as non forested in LCDB1

<sup>3</sup> Not imaged = not visible in satellite imagery but identified during the field checking phase

### 2.4.3 Mohaka Catchment

The analysis of the land-cover classes within the 30m buffer of the rivers and streams in the Mohaka Catchment (in its entirety) indicates a higher level of protection of the river from the input of nutrients and sediments (Table 4). Indigenous forest is present in 49% of the riparian buffer of the Mohaka catchment indicating that 49% of the catchment is protected by an intact vegetative buffer. In addition there is a further 16% of protection of the riparian margins where Manuka/Kanuka shrubs are present. The catchment has 11% of high production grassland within the riparian margins indicating that there is a lower potential of input from sediment and nutrients in these areas. It is worth noting that this analysis includes the upper Mohaka Catchment that is dominated by the Kaweka Forest Park. Land cover analysis of the 30m buffer of the lower Mohaka Catchment (presented shortly) returns quite a different result.

LCDB2NAME	Total Hectares	Percent (%)
Afforestation (imaged, post LCDB 1)	124.86	0.32
Afforestation (not imaged)	298.02	0.76
Alpine Gravel and Rock	10.35	0.03
Broadleaved Indigenous Hardwoods	791.28	2.01
Built-up Area	0.81	0.00
Deciduous Hardwoods	37.2	0.09
Fernland	28.51	0.07
Forest Harvested	576.44	1.46
Gorse and Broom	421.58	1.07
Herbaceous Freshwater Vegetation	13.74	0.03
High Producing Exotic Grassland	4592.8	11.64
Indigenous Forest	19484.34	49.38
Landslide	33.91	0.09
Low Producing Grassland	752.52	1.91
Major Shelterbelts	9.52	0.02
Manuka and or Kanuka	6211.57	15.74
Mixed Exotic Shrubland	14.5	0.04
Other Exotic Forest	95.19	0.24
Pine Forest - Closed Canopy	4046.27	10.25
Pine Forest - Open Canopy	995.23	2.52
River	659.85	1.67
River and Lakeshore Gravel and Rock	147.96	0.37
Short-rotation Cropland	19.87	0.05
Sub Alpine Shrubland	9.56	0.02
Surface Mine	2.6	0.01
Tall Tussock Grassland	55.7	0.14
Transport Infrastructure	4.95	0.01
Vineyard	8.17	0.02
Grand Total	39459.86	100

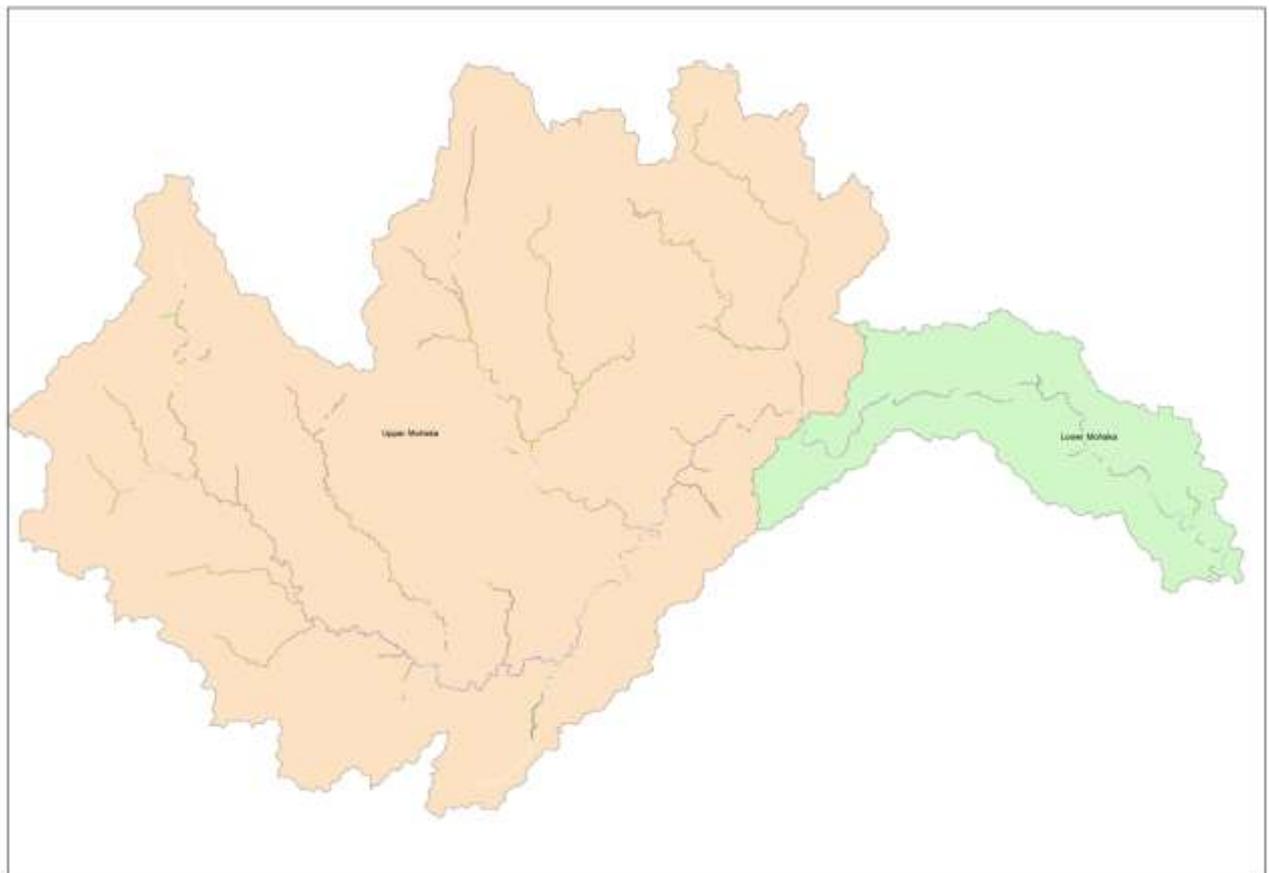
**Table 4: Land cover classes within the 30m buffer of the entire Mohaka catchment. The analysis has been carried out on all stream orders (1<sup>st</sup> to 8<sup>th</sup> order).**

As mentioned previously, there is a marked difference in the proportions of land cover classes between the upper and lower Mohaka Catchment. This is due to the dominance of the Kaweka Forest Park in the upper catchment coupled with terrain limitations on land intensification in the upper Mohaka catchment. This has resulted in the upper catchment being heavily forested with indigenous vegetation.

To better represent riparian protection as well as comparing the upper and the lower Mohaka catchment in the context of riparian cover, four separate levels of analysis were needed. These analysis included:

- An analysis of all rivers and streams within the upper and lower catchments separately.
- An analysis of the rivers and streams within the upper and lower catchments for all stream orders and for 4<sup>th</sup> order streams or greater (larger streams and rivers).

Figure 2 contrasts the spatial extent of the upper and lower Mohaka catchments as well as the locations of the major rivers.



**Figure 2: Extent of the upper (orange) and lower (green) Mohaka catchments and their major rivers**

#### 2.4.4 Lower Mohaka (4<sup>th</sup> – 8<sup>th</sup> order streams)

Only 4<sup>th</sup> order streams and above were selected in the following analysis to determine the vegetative buffer present on major rivers and streams of the lower Mohaka catchment (Figure 2.). The results are presented in Table 5.

LCDB2NAME	Total Hectares	Percent (%)
Afforestation (not imaged)	6.54	1.63
Broadleaved Indigenous Hardwoods	11.06	2.76
Deciduous Hardwoods	0.67	0.17
Gorse and Broom	6.55	1.64
High Producing Exotic Grassland	51.64	12.89
Indigenous Forest	17.37	4.34
Landslide	3.67	0.92
Low Producing Grassland	13.76	3.44
Manuka and or Kanuka	110.81	27.66
Mixed Exotic Shrubland	1.08	0.27
Pine Forest - Closed Canopy	10.00	2.50
Pine Forest - Open Canopy	0.98	0.24
River	136.98	34.19
River and Lakeshore Gravel and Rock	25.46	6.35
Short-rotation Cropland	3.55	0.89
Vineyard	0.48	0.12
Grand Total	400.60	100.00

**Table 5: Proportions of land cover within the 30m buffer of all 4<sup>th</sup> to 8<sup>th</sup> order rivers (REC) within the lower Mohaka catchment.**

#### 2.4.5 Lower Mohaka (all rivers and streams)

A similar analysis was completed for all rivers and streams (1<sup>st</sup> to 8<sup>th</sup> order) draining the lower Mohaka catchment and the results are presented in Table 6.

LCDB2NAME	Total Hectares	Percent (%)
Afforestation (imaged, post LCDB 1)	26.28	0.46
Afforestation (not imaged)	286.98	5.07
Alpine Gravel and Rock	1.23	0.02
Broadleaved Indigenous Hardwoods	238.32	4.21
Deciduous Hardwoods	12.53	0.22
Fernland	2.90	0.05
Forest Harvested	88.33	1.56
Gorse and Broom	104.23	1.84
High Producing Exotic Grassland	1191.94	21.05
Indigenous Forest	594.60	10.50
Landslide	15.89	0.28
Low Producing Grassland	216.20	3.82
Major Shelterbelts	3.29	0.06
Manuka and or Kanuka	761.48	13.45
Mixed Exotic Shrubland	3.86	0.07
Other Exotic Forest	3.77	0.07
Pine Forest - Closed Canopy	1227.63	21.68
Pine Forest - Open Canopy	579.43	10.23
River	233.07	4.13
River and Lakeshore Gravel and Rock	49.57	0.88
Short-rotation Cropland	9.66	0.17
Surface Mine	2.61	0.05
Vineyard	8.05	0.14
<b>Grand Total</b>	<b>5662.34</b>	<b>100.00</b>

**Table 6: Proportions of land cover within the 30m buffer of all rivers and streams in the lower Mohaka cathment.**

**2.4.6 Upper Mohaka (4<sup>th</sup> -8<sup>th</sup> order streams)**

Only streams with a stream order of 4 and above were selected for the following analysis with an aim to determine the vegetative buffer present on the major rivers and streams of the upper Mohaka catchment (Figure 2.). The results of this analysis are presented in Table 7.

LCDB2NAME	Total Hectares	Percent (%)
Broadleaved Indigenous Hardwoods	55.27	8.97
Forest Harvested	1.68	0.27
Gorse and Broom	17.14	2.78
High Producing Exotic Grassland	35.60	5.78
Indigenous Forest	283.78	46.07
Landslide	0.46	0.07
Low Producing Grassland	24.23	3.93
Manuka and or Kanuka	162.43	26.37
Other Exotic Forest	3.00	0.49
Pine Forest - Closed Canopy	1.11	0.18
Pine Forest - Open Canopy	1.35	0.22
River	23.34	3.79
River and Lakeshore Gravel and Rock	6.57	1.07
Grand Total	615.97	100.00

**Table 7: Proportions of land cover within the 30m buffer of all 4<sup>th</sup> to 8<sup>th</sup> order streams and rivers (REC) within the upper Mohaka catchment.**

**2.4.7 Upper Mohaka (all river orders)**

A similar analysis was completed for all the river and streams draining into the upper Mohaka catchment and the results are presented in Table 8.

LCDB2NAME	Total Hectares	Percent (%)
Afforestation (imaged, post LCDB 1)	98.84	0.29
Afforestation (not imaged)	10.68	0.03
Alpine Gravel and Rock	9.13	0.03
Broadleaved Indigenous Hardwoods	554.03	1.64
Built-up Area	0.81	0.00
Deciduous Hardwoods	24.74	0.07
Fernland	25.66	0.08
Forest Harvested	489.09	1.45
Gorse and Broom	318.1	0.94
Herbaceous Freshwater Vegetation	13.75	0.04
High Producing Exotic Grassland	3397.47	10.04
Indigenous Forest	18920.4	55.91
Landslide	18.11	0.05

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Low Producing Grassland	537.74	1.59
Major Shelterbelts	6.04	0.02
Manuka and or Kanuka	5461.11	16.14
Mixed Exotic Shrubland	10.66	0.03
Other Exotic Forest	91.58	0.27
Pine Forest - Closed Canopy	2818.13	8.33
Pine Forest - Open Canopy	417.7	1.23
River	428.01	1.30
River and Lakeshore Gravel and Rock	98.68	0.29
Short-rotation Cropland	10.24	0.03
Sub Alpine Shrubland	9.57	0.03
Tall Tussock Grassland	55.78	0.16
Transport Infrastructure	4.95	0.01
Vineyard	0.14	0.00
<b>Grand Total</b>	<b>33843.26</b>	<b>100.00</b>

**Table 8: Proportions of land cover within the 30m buffer of all rivers and streams within the upper Mohaka catchment**

#### 2.4.8 Summary

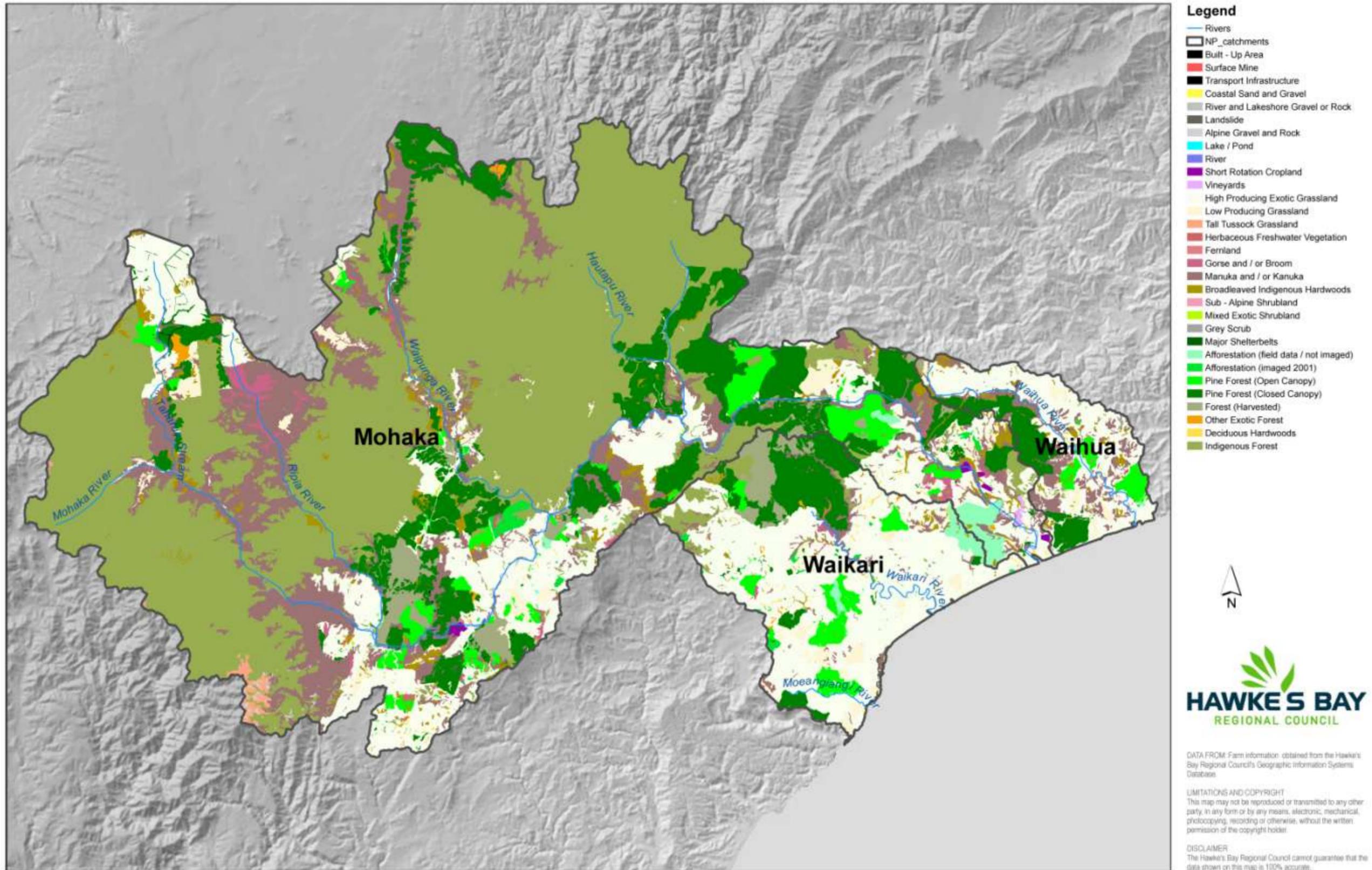
Map 1 gives a graphical summary of the information stored in the New Zealand LCDB2 database that was used for the GIS analysis of vegetation cover throughout the Ngati Pahauwera rohe and the Mohaka River catchment as a whole.

The analysis has shown that stream protection from native riparian vegetation throughout the Waikari, Waihua and lower Mohaka rivers is very limited, with little native vegetation left in the riparian zone of these rivers and associated streams.

As demonstrated with the analysis of the LDCB2 GIS database layer and the results presented in tables 1 through table 8, it is possible to tailor the analysis or query to suit the question at hand. If there is a specific area or attribute of interest, such as running a similar analysis on the Te Hoe River catchment, then the capability readily exists for this to be done.

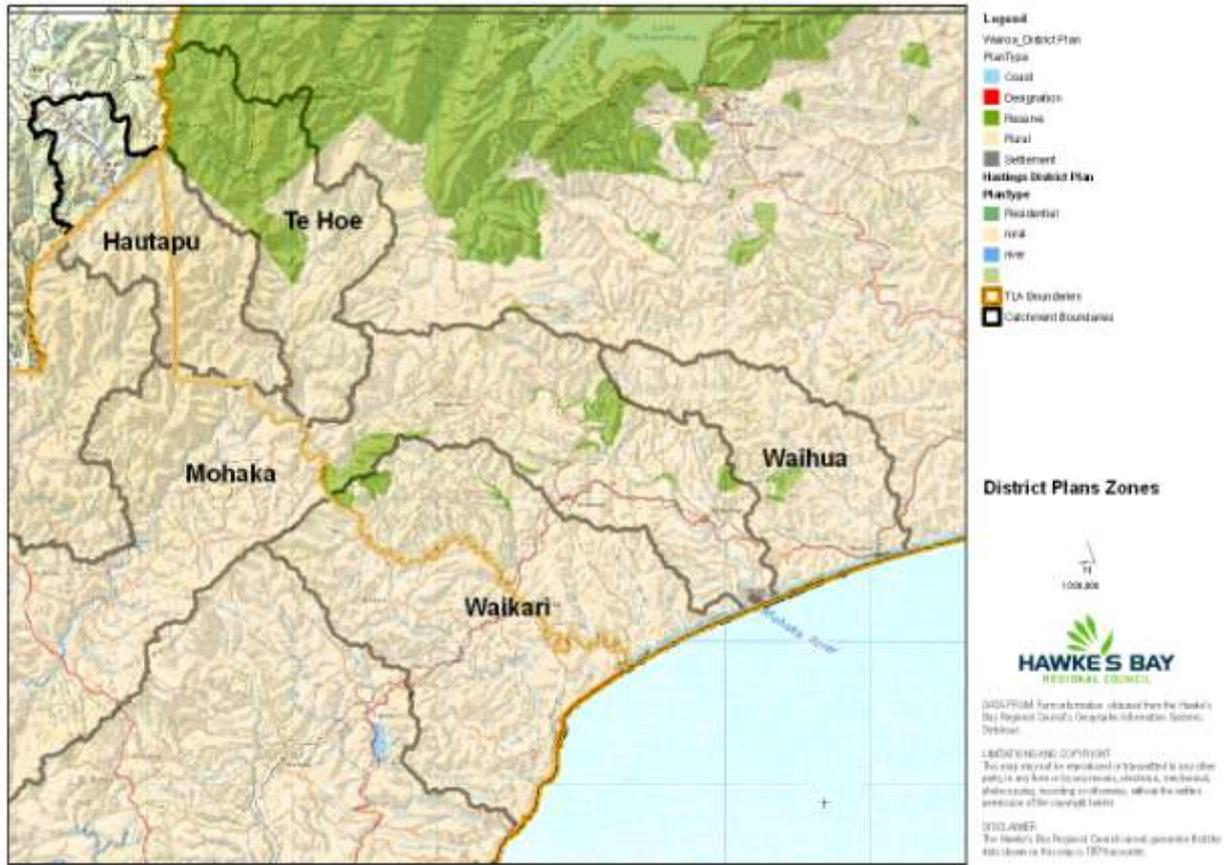
As previously stated, the LDCB2 database was released in 2004 and was based on information that was current as of 2001. Some land cover characteristics would have changed since this time. However, until the release of LDCB3, the extent of this change is difficult to quantify without extensive and costly analysis of up-to-date aerial photography or similar media. The analysis as presented does however give an accurate representation of the dominant land covers in each of the main river catchments and satisfactorily meets the objectives of the exercise.

### Map showing Landcover classes (LCDB2) of the Mohaka, Waikari and Waihua Catchments



## 2.5 Land use zones

Land use zones are specified within the Hastings District Council and Wairoa District Council Plans to ensure that land use activities within the geographical boundaries of each council are compliant with their respective plans. The rating of a property is dependent upon the land use that the property falls within. The map which follows (Map 2) shows the permitted land uses, as specified by the Hastings District Council and Wairoa District Council, within the Waihua, Mohaka and Waikari catchments.



**Map 2: District Council specified land use zones within the rohe of Ngati Pahauwera**

With the exception of a few small areas of reserve, the land areas covered by this report are classed as rural.

## 2.6 Commercial activities

Tourism activities within the catchments of the rohe of Ngati Pahauwera focus on recreational activities that include freshwater angling, hunting, rafting and recreational hiking. A brief from Janet Takarangi of Venture Hawke's Bay follows:

**Fishing:** "I have discussed the issue of land use impacts on fishing with the NZ Chairman of the Professional Fishing Guides. He has been able to inform me that there is fishing occurring but many of the rivers in the catchment area are of variable quality for fishing. The best river sites are land locked and access rights have been sold to operators who bring in visitors for fishing and hunting on helicopters. Over the last 12 months some 100+ helicopter trips have been made into the area. Since the Rotorua airport has had trans-Tasman access the numbers for this opportunity have increased. This links directly to some of the operators being based in Rotorua and Taupo. Poronui Station on the Taharua River has the biggest degree of activity of this type".

It is difficult to ascertain the value of this quite hidden commercial activity because of the private ownership attached to land locked blocks and the air access by helicopter.

**Hunting** is covered under the same access as above.

**Rafting:** there is considerable interest in rafting the Mohaka River (go to [www.ranker.co.nz](http://www.ranker.co.nz) for comments from recent rafters on their experiences in rafting the Mohaka River) with interest showing that there is a market for this offering to visitors, but given the high level of compliance required for safety reasons, the profit may be small.

**Commercial eeling** is governed by the Ministry of Fisheries (MFish) who provide permits and run a quota management system. No commercial eeling occurs within the Mohaka Catchment as it is not permitted under current commercial fishing legislation. The Waikari and Waihua rivers are open to commercial eeling and form part of fisheries management area 2 (FM2). FM2 covers an extensive area of coast from the East Cape through to the west coast of Wellington. A map of FM2 is downloadable from [www.nabis.govt.nz](http://www.nabis.govt.nz). No information was able to be sourced describing the extent of commercial eeling operations in these two catchments.

Before you can commercialise any water based recreational opportunities you need to be able to have professional guides that assume control. Ngati Pahaurewa may need to invest in training for young people to be trained as guides and to become members of the Guide Association.

A physical base is also needed to work from hence the reason why private investors have put in lodges on private blocks. For a number of activities it is also necessary to have helicopter landing rights in place.

The NZ Chairman of the Professional Fishing Guides indicated that the Taharua River and part of the upper Mohaka River has lost all good fishing due to degradation in water quality that stems from land intensification and conversion from native vegetation to grazing to dairy farming.

### 2.6.1 Department of Conservation held concessionaries

A concession is an official authorisation to operate in an area managed by the Department of Conservation (DOC). It may be in the form of a lease, licence, permit or easement.

DOC issue concessions for specific recreational activities within the DOC estate. Each concession document includes standard and special conditions relating to the proposed activities and specific conditions relevant to the management goals of the area.

The following authorised concessionaires have a guiding permit for a Term of 5 years.

- Marlene Skeet t/a One Cast Adventures
- Multi-Day Adventures
- Kiwi Adventure Company (NZ) Ltd
- Rapid Sensations
- New Zealand Professional Guide Association
- G L Jansen
- Hayward Standing Ltd

The standard and special conditions outlined in permits to concessionaries include rules pertaining to:

- Occupation of DOC huts
- Respecting nesting areas for riverine birds
- Keeping vehicles to tracks
- The need for fire extinguishers

- Washing of boats and waders to prevent the spread of unwanted plant life
- Refueling boats on land
- Not overloading existing structures
- Burying faecal matter when not in the vicinity of toilets
- Participating in search and rescue efforts
- Consulting with iwi on wahi tapu or urupara
- Protection of wilderness areas
- Camping
- Use of aircraft
- Rubbish removal
- Care of vegetation
- Keeping to the track
- Lighting of fires

For further information the reader is advised to read Appendix 5 which lists all the special conditions pertaining to these concessions. In some instances the concessions are not specific to the rohe of Ngati Pahauwera and may pertain to the East Coast of Hawke's Bay or Wellington conservancies

The author is unaware of any studies undertaken to investigate the impacts of tourism on environmental conditions of the river catchments in question, however, most tourism activities should have negligible effect with the exception of jet boating, which may have some effects, particularly on bank-side erosion from boat wash. Having said that, conditions in some concessions do specify speed limits for boat travel, however the effects of these speeds on river bank erosion have not been tested.

### 2.6.2 Hydro electricity generation

The only river within the Ngati Pahauwera rohe that has potential for hydro electricity generation is the Mohaka River. In 2006 Meridian Energy commissioned NIWA to undertake an assessment of potential effects if a hydro electric power station was to be operating within the lower reaches of the Mohaka River (located just downstream of Willowflat at Karakiki). For a summary of the ecological findings of this research refer to section 3.1.1 and 3.3.1.

### 2.6.3 Dairying

Of the three catchments, the upper Mohaka is the only catchment that is subject to intensive dairying. Approximately 28% of the Taharua River catchment (a tributary of the upper Mohaka River) is in dairy farming. Dissolved inorganic nitrogen concentrations in this river have been trending upward since 2000 (Stansfield, 2008). However this trend is not evident at sites located further down the Mohaka River system at HBRC sampling sites located at Willowflat and Raupunga (Stansfield, 2009). Additional discussion on water quality is provided in section 3.1.

Instream ecological impacts in the Mohaka River directly downstream of the Taharua River confluence are evident in the form of increased algal biomass, a reduction in water clarity and reduced macroinvertebrate diversity. These impacts are likely the result of increased nitrogen loading from the Taharua catchment. Due to difficulties in accessing the Mohaka River downstream of the Taharua confluence, no work has been done to assess the longitudinal extent of this effect. The HBRC monitors a site on the Mohaka River downstream of the Ripia confluence (a short-term monitoring site) as well as the Mohaka River at Willowflat (a long-term SoE monitoring site – refer Map 2). The effects of high nitrogen inflows from the Taharua River are

unable to be measured at these points but a number of inflowing tributaries (such as the Ripia) coupled with a significant distance between sampling points would combine to dilute the effects of the Taharua inflows. It is therefore not possible to make comment on the distance downstream of the Taharua that measureable ecological impacts occur in the Mohaka River.

Owing to the concern over land use pressures on the water quality of the Taharua River, and in turn downstream in the Mohaka River, considerable effort has been made to increase riparian protection. Throughout the Taharua catchment extensive stream reaches have been fenced and this work is programmed to continue. Riparian planting will be negotiated and undertaken later once fencing is complete. Some areas will be planted and others are likely to be left in long grass. The riparian fencing currently programmed (overlapping the 2009-2010 and 2010-2011 season) totals 48km of fencing which will protect approximately 28km of stream length. Due to receivership of Taharua Farms their part of the fencing programme is being re-negotiated. Currently half of the total amount programmed for the catchment has been completed. A smaller amount of fencing may take place in 2011-2012 to complete fencing of riparian areas of the majority of the catchment. The final length of stream to fence to achieve this over 2011-2012 would be less than 8km.

Further information on the effects of dairying on invertebrates and trout energetic in the Taharua and upper Mohaka catchments can be found in Shearer (2009).

#### 2.6.4 Forestry

No studies have been undertaken within the Mohaka, Waikari or Waihua river catchments with respect to forestry operation effects on stream water quality and ecology. However, an extensive study has been undertaken in the Pakuratahi River catchment (approximately 20km north of Napier) which compared a catchment utilised for commercial forestry operations and an adjacent catchment used for grazing. The key findings of this study showed that for a highly erosive catchment:

- Mature forest produced 6% less water than one in pasture.
- Pasture produced 4 times more sediment than mature forest.
- During harvest there was a 6 fold increase in suspended sediment yield to the stream.
- Sediment yield reduced to those of a mature forest within 3 years of harvesting.
- During harvest, native fish and macroinvertebrate communities in the forestry catchment became similar to pasture but returned to pre-harvest levels within 3-5 years.
- These findings can relate to more than 700,000 ha of North Island hill country.

For further information, the reader is advised to consult Eyles and Fahey (2006).

#### 2.6.5 Pollution incidents

Documented information on pollution incidents within the rohe of Ngati Pahauwera is very limited. For a period running from 1999 to the present date, the HBRC has 30 incidents reported.

From this limited record, it is difficult to deduce the extent of pollution within the study area. Further on ground surveys would be required to assess the extent and impacts of these types of activities.

### 2.7 Non Commercial Uses

A report published by Taylor Baines and Associates and Tureiti Moxon (2006) provided an account of a recreational usage survey of the Mohaka River which was undertaken in the summer of 1990/91. The author acknowledges that while the research is old, it may provide a baseline for comparisons with current observations. Please note, **Taylor Baines and Associates and Tureiti Moxon (2006) do not cite the source from where the information was taken.**

The recreational usage survey indicated some important differences between mid and lower reaches of the river. In the middle reaches the most popular recreational activities were:

1. Fishing (52%)
2. Swimming (48%)
3. Rafting (20%)
4. Picnicking (19%)
5. Camping (17%)

While the lower reaches showed a different range of activities with the five most popular being

1. Fishing (63%)
2. Swimming (48%)
3. Relaxing (14%)
4. Bathing (11%)
5. Eating/Cooking (9%)

While it was reported that the lower reaches still attracted more people from the rest of Hawke's Bay region (47%) than the Mohaka Valley itself (23%), the report also notes "In the lower river sub-sample, locals who went down to the river 'for a look' several times a day were not surveyed as it is debatable whether their visit could be defined as recreational in nature".

Using this rationale, the report stated that "The middle river is visited predominantly for recreation while the lower river is used as an everyday 'life resource' as well as for recreational purposes."

The report concludes some additional findings as follows:

- *Local and regional residents are the main recreational users of the Mohaka River.*
- *The Mohaka River is used for recreation all year round, reflecting the degree of local use, but peak use occurs during summer.*
- *Use varies between the middle and lower reaches of the river.*
- *In the lower reaches, the activities and reasons for visiting reflect the practical nature of river use, illustrated by the importance of the river as a bath to the local community, some of whom rely on tank water for their domestic water supply.*
- *The recreational focus of the middle reaches derives from physical conditions which make the gorge section popular for activities such as rafting; while campsites attract camping and picnicking.*
- *Maori use was focused along the lower reaches while commercial use was focused along the middle reaches.*
- *Most people visit the Mohaka River with family or friends.*

Discussions with recreational user groups (Hawke's Bay Canoe Club, Hawke's Bay Adventure Racing Club, local residents and a chartered jet boat operator) confirmed that recreational use of the river was relatively high in the middle reaches either side of the Napier-Taupo highway (SH5) down to just below the Willowflat bridge. Cultural and local recreational use was also relatively high downstream of the viaduct near Raupunga.

Most interviewees remarked that usage patterns reflect accessibility. For further information on the recreational value of the Mohaka River refer to the report published by Taylor Baines and Associates and Tureiti Moxon (2006).

### 3.0 HEALTH OF THE RIVERS

This chapter outlines what is known of the catchments with respect to water quality, ecology (including fish), riparian vegetation extent, and hydrology.

#### 3.1 Water Quality

In general water quality is monitored on a quarterly basis as part of Council's State of the Environment (SOE) water quality/ecology monitoring program (see Map 3). Table 9 outlines water quality data that is available as part of this program from Hawke's Bay Regional Council's PUDDLE database.

Site	Catchment	Water Quality Variables	Record Length
Mohaka River @ Raupunga	Mohaka	Water clarity, nutrients, conductivity, pH, dissolved oxygen, suspended solids, total organic carbon, turbidity, temperature, G440, dissolved calcium, magnesium, chloride, potassium, sulphate, total hardness, alkalinity, bicarbonate, carbonate, <i>E.coli</i> , Faecal coliforms	March 1995 to the present
Mohaka river @ Willowflat	Mohaka	As above	February 1997 to the present
Waihua River @ Waihua Valley Rd	Waihua	As above, except no <i>E.coli</i> .	April 1995 to May 2000
Waikari River @ Glenbrook Rd	Waikari	As above, except no G440, no potassium, chloride or sulphate	August 2000 to the present

**Table 9: Water quality records from the catchments.**

Data for the two lower Mohaka River sites (Willowflat and Raupunga) and the Waikari River is quite extensive and of sufficient duration to be used for time series analysis and approximate nutrient loading estimations.

Alternatively, the data for the Waihua Catchment is of shorter duration (5 years), with monitoring ceasing at this site in May 2000. This was due to budgetary constraints at the time. In 2004, the Waihua River was compared to other stream sites of the same river environment classification (REC = low elevation, soft sedimentary, pastoral) (Stansfield, 2004). The results showed that the Waihua River had very similar clarity, nutrients (dissolved reactive phosphorus, ammoniacal nitrogen and nitrate nitrogen), bacteria (faecal coliform) and clarity values to the 12 other regional sites analysed of the same stream type and REC classification. The historic dataset for the Waihua River is therefore adequate to describe the general water quality characteristics of the river but due to the site not being monitored since 2000, it is not possible to comment on the current state of the river.

Note: The author is unaware of any water quality data that exists for the Te Hoe Catchment.

National comparisons of water clarity made by Stansfield (2009), show that the lower Mohaka River is low and turbidity high for its river environment classification. This concurs with Spigel (2007) who states that

- *Water clarity is lower and turbidity higher than the national average with the increase in turbidity in the lower Mohaka being attributable to an increase in fine mineral sediments as the river flows through more erodible terrain in the middle and lower catchment;*

In addressing the low levels of water clarity in the lower Mohaka River, Spigel (2007) refers to a report prepared by the Hawke's Bay Catchment Board (HBCB 1986, p. 63) that states "the long term discolouration of the lower Mohaka River is due mainly to the input of silt from the Te Hoe River and the resuspension of silt in the middle reaches of the Mohaka River (between Glenfalls and Willow Flat)". The HBCB report goes on to say (1986, p. 86) that "man has had a major influence on the vegetation of the catchment", having cleared large areas for pasture and exotic forestry. Some of this land has proved too erosion prone and/or infertile, and has been left to revert to shrub land. The remaining indigenous (primarily beech-podocarp) forest is confined to steep greywacke lands in the central catchment. A large portion of the catchment is sensitive to "practices that are likely to facilitate erosion, flooding, or deposition in water courses" (HBCB 1986, p. 11), and this includes large areas of greywacke steeplands (source of the gravel supply discussed by Hicks et al (2006)), as well as virtually all of the Tertiary steeplands that supply sand, silt and clay to the lower river, making it "very turbid ...during fresh flows" (HBCB 1986, p. 51).

Spigel (2007) also found that

- *Total nitrogen and dissolved inorganic nitrogen (DIN) are low (approximately half) compared to national averages. Total phosphorus and dissolved reactive phosphorus are greater than or similar to national averages*

Stansfield's (2009) analysis concurs with the relatively low dissolved inorganic nitrogen concentrations in the lower reaches of the Mohaka River (at Raupunga), however further upstream concentrations are higher at Willowflat which is a site not monitored by NIWA.

Stansfield's (2009) report also indicates that the lower Mohaka River sites have comparably good dissolved reactive phosphorus concentrations when compared to national averages. This is different to the analysis undertaken by Spigel (2007). The reason for this is Spigel uses national water quality network data only whereas Stansfield uses national plus regional water quality network data.

Stansfield notes that the high soluble inorganic nitrogen and soluble reactive phosphorus concentrations in the Taharua River are a concern. He also notes that the Waikari River shows good water quality when compared to other streams of similar REC type.

Additionally, based on monthly data taken from the NIWA National River Water Quality Network (NRWQN) site from 1989 through to 2005, Spigel (2007) concluded that for the Mohaka River at Raupunga:

- pH is high in the Mohaka River at Raupunga where elevated levels are attributable to increased primary production by benthic algae;
- Mean water temperature at Raupunga is approximately 1 °C warmer than the national average whereas electrical conductivity (a surrogate for total dissolved solids and dissolved ionic concentrations) is similar to the national average;

Stansfield (2009) undertook a different analysis in which compliance with guidelines for pH and water temperature were examined. Overall the Mohaka River shows excellent compliance with water temperature for the protection of trout and sensitive invertebrate taxa and pH for native and introduced fish. The results of the Stansfield analysis are outlined in Table 10.

Site Type	Site	SRP (mg/l, median)		SIN (mg/l, median)		<i>E.coli</i> (/100ml,)		Clarity (m, median)	
		National median	Site median	National median	Site median	National median	Site median	National median	Site median
Lowland pastoral streams	Waikari River @ Glenbrook	0.016	0.016	0.55	0.224	1542	260	1.2	1.87
	Mohaka @ Raupunga		0.011		0.14		23		0.7
Upland natural streams	Waiarua Stream @ SH5	0.006	0.004	0.068	0.42	117	65	2.9	1.48
	Mohaka u/s of Taharua Confluence		0.003		0.02		27		2.68
	Mohaka d/s of Taharua Confluence		0.005		0.47		40		2.38
Upland Pastoral Streams	Mohaka @ Willowflat	0.009	0.008	0.098	0.135	517	20	1.5	0.85
	Taharua @ Wairango		0.019		2.59		82		3.8
	Taharua @ Twin Culverts		0.016		2.78		230		2.85
	Taharua @ Poronui Station		0.011		1.14		120		1.94
	Taharua @ Red Hut		0.007		1.06		83		1.54
	Ripia River		0.009		0.09		772		2.98
	Mokomokonui River		0.011		0.05		17		2.41
	Waipunga River @ Pohokura Rd		0.006		0.13		26		1.51

**Table 10: Comparison of water quality statistics for the Mohaka Catchment with national values (1997-2002). Green shading indicates better water quality than the national median, red shading indicates worse water quality than the national median.**

Recent time series trend analysis of the lower Mohaka sites showed declining dissolved reactive phosphorus and no significant change in other water quality variables (dissolved inorganic nitrogen, *E.coli* and water clarity) (Stansfield, 2009). This is encouraging and would indicate that the intensive land uses and associated declining water quality in the upper sub catchment of the Taharua at this stage is not adversely affecting the lower reaches of the Mohaka River. Having said that water clarity in the lower Mohaka is less than desirable when compared to national averages for its river environment classification. No significant time trends have been reported for the Waikari Catchment (Stansfield 2009).

The state of the environment water quality monitoring programme was recently reviewed (Haidekker, 2010) which resulted in the introduction of a new site in the Tutaekuri catchment and a reintroduction of two historic sites in the Wairoa catchment. No additional sites were introduced in the Waihua, Mohaka or Waikari River catchments.

### 3.1.1 Potential Water Quality Effects of a Proposed Dam at Kakariki

Spigel (2007) investigated possible water quality issues associated with the proposed hydro-dam. Overall, water quality was estimated to be good with the exception of reduced clarity and high pH. Due to the relatively short water residence times in the dam, the exact nature of water quality changes that would occur would depend strongly on how the outflows from the reservoir were

managed, in particular on the height or level of water column at which water is drawn off. By providing for an offtake structure that has the capability of withdrawing water from multiple levels within the reservoir, it would be possible to minimise and some cases, avoid adverse consequences associated with hypolimnetic oxygen depletion and resulting changes in water chemistry.

Hicks et al (2007) investigated the sedimentation effects of a proposed hydro dam on the Mohaka River near Kakariki. It was estimated that the proposed dam would initially trap sediment at a rate of approximately 0.5 million cubic metres per year. At this rate, the dam would be substantially full of sediment after approximately 100 years but the dam would not return to fully riverine conditions for approximately 200 years. Left alone, a sandy gravel delta would form first in the Willow Flat area, and would slowly advance down the lake. Forty to fifty years would pass before any effects appeared at the mouth. Thereafter, the mouth would likely evolve slowly towards a more sandy system similar to the mouth of the nearby Waikari River with a wider, shallow outlet channel and a lower beach. A sandy mouth system would tend to be less stable in form, and the backshore may be more prone to wave attack. The estuary would be deeper and would extend further upstream. The researchers concluded that further, more detailed investigations would be required if the dam proposal proceeds to a more advanced stage. The researchers recommended further numerical modelling to provide a more reliable estimates of reservoir life, delta form and advance rates and possible operations to assist sediment bypassing under partial or full reservoir draw-down conditions during natural flood events.



### 3.2 Aquatic Ecology – macroinvertebrates and algae

Aquatic ecology monitoring occurs annually during summer low flow periods at all SOE monitoring sites. Monitoring comprises periphyton (algae) biomass and taxonomy and macroinvertebrate taxonomy (snails, crustaceans, worms and insect larvae that live in the stream bed) while fish monitoring occurs 5 yearly. The exception is if targeted studies require additional information outside of the standard SoE monitoring program. An example of such a study is the detailed study currently ongoing in the upper Mohaka and Taharua River catchments. The fish monitoring is limited to wadeable stream reaches for logistical and health and safety reasons.

Table 11 shows the periphyton and macroinvertebrate data that is available from HBRC's PUDDLE database. The datasets for the lower Mohaka (Raupunga and Willowflat) and Waikari River are considered reliable for preliminary time series analysis. Results from the recent State of the Environment technical report indicates no change in periphyton biomass or macroinvertebrate community composition since monitoring began (Stansfield 2009).

Site	Catchment	Aquatic Ecology Variables	Record Length
Mohaka River @ Raupunga	Mohaka	Periphyton biomass and taxonomy and macroinvertebrate taxonomy.	February 2001 to the present
Mohaka river @ Willowflat	Mohaka	As above	February 2001 to the present
Waihua River @ Waihua Valley Rd	Waihua	No aquatic ecology data available	
Waikari River @ Glenbrook Rd	Waikari	Periphyton biomass and taxonomy and macroinvertebrate taxonomy.	February 2001 to the present

**Table 11: Data available for periphyton and macroinvertebrate information from the HBRC's SOE monitoring network.**

In summary, for the Mohaka River at both the Raupunga and Willowflat sites, no significant change in ecosystem health has been observed since monitoring commenced. Macroinvertebrate health is generally found to be excellent (mean Macroinvertebrate Community Index (MCI) = 118 and 121 respectively indicating excellent health), however some periphyton biomass exceedances above guideline levels do occur, particularly at the Raupunga site (12% compliant with benthic biodiversity guidelines). The Waikari River site has a reduced macroinvertebrate health (mean MCI = 106 indicating mild enrichment status with a slightly impacted macroinvertebrate community) when compared to the Mohaka River sites and likely reflects a site that is impacted on by mild nutrient and organic enrichment. No significant negative or positive change in ecosystem health has been observed at this site since monitoring commenced. Periphyton biomass levels are generally within guideline limits at the Waikari River site (87.5% compliant with benthic biodiversity guidelines).

Note: the author is unaware of any periphyton or macroinvertebrate data that exists for the Waihua River or Te Hoe River catchments.

### 3.3 Aquatic Ecology – fish

Table 12 lists all records of fish surveys undertaken in the Mohaka, Waihua and Waikari river catchments as listed on the New Zealand Freshwater Fish database. Assuming the database holds all fish records collected by the various departments that contribute to it (DOC, NIWA, Regional Councils, CRI's etc); it is likely that no fish community surveys have occurred in the Waihua River.

Few records exist for the lower Mohaka River mainstem, this is likely to be due to the swiftness and depth of reaches in the lower reaches making it unsafe to survey. The records for the Waikari River are the most recent. Additionally, the lower reaches of this river are due to be surveyed next year as part of Council's State of the Environment monitoring programme. The Te Hoe River has not been surveyed since 1988. The data for all sites is largely presence / absence of fish species however there is good information of minimum and maximum lengths of fish for the Te Hoe and Waikari Rivers. This data could be useful for making comparisons with future fish surveys.

Site	Catchment	Native fish	Methods Used
Lower Mohaka River Mainstem	Mohaka	7 records ,6 records from 1983, 1 record from 1985 Longfin eel, shortfin eel, common bully, patiki	Electric Fishing only
Waihua River @ Waihua Valley Rd	Waihua	No fish data available	
Waikari River @ Glenbrook Rd	Waikari	28 records, 26 for 1999, 2 records for 2003 Koura, longfin eel, common smelt, torrent fish, inanga, common bully, blue gill bully, shortfin eel, giant bully, yellow eyed mullet, estuarine triple fin,	Electric Fishing, Bait trap, Gill net
Te Hoe River	Mohaka	19 records, 13 for 1983, 6 for 1988 Rainbow trout, koaro, blue gill bully, longfin eel, brown trout, shortfin eel,	Electric Fishing only

**Table 12: Fish monitoring information extracted from the New Zealand Freshwater Fish Database**

Based on records taken from the New Zealand Freshwater Fish database, at least 13 species of native freshwater fish have been reported from the Mohaka River, of which seven are endemic (found only in New Zealand). With the exception of Cran's Bully all the native fish that inhabit the Mohaka River are migratory and spend part of their life in the sea. The distribution patterns of migratory species within New Zealand rivers reflects their life history, with the number of species decreasing markedly with distance upstream (Bonnett 1986, Davis et al 1983). In the Mohaka this is certainly the case and Strickland (1985) based on records taken from the New Zealand Freshwater Fish database, reported the greatest diversity of fish species being found in the first 21km upstream of the sea.

None of the historical surveys included all possible fishing techniques (hinaki, g minnow trap (bait trap), night spotlighting, seine or fyke netting and electric fishing). This may be due to the characteristics of the reaches surveyed not being suitable for all techniques, having said that night spot lighting has really only become a routine fishing method in the last 10 years. Fish monitoring protocols have recently been developed that ensure there is consistency in monitoring effort of streams (David 2006). None of the data that applies to this report is likely to have been generated by these protocols as they are currently in a draft format and not widely used at present.

Map 4 shows fish monitoring locations throughout the catchments as listed in the New Zealand Freshwater Fish database. Sites in the upper Mohaka River upstream of the Te Hoe River confluence are included.

Fish and Game New Zealand produced a resource inventory for the Mohaka Catchment in 2002 (Hickey 2002) which indicated a healthy trout fishery. No reports on trout fisheries of the Waihua or Waikari catchments have been done as they are not considered to be highly valued fisheries.

In response to a proposed hydro dam on the Mohaka River at Karakiki (discussed briefly in section 3.1.1 and discussed in more detail shortly), Bonnett et al (2007) undertook a number of studies looking at fish distribution in the lower Mohaka River. Bonnett et al (2007) stressed the importance of longfin eel in the Mohaka River and the river's reserve status which protects these fish from commercial eeling. Unlike most other rivers in New Zealand longfin eels were the dominant species in the Mohaka River comprising 98.7% by number and 99% by weight of fyke netted eels. This is in marked contrast to the commercial eel fishery in the Hawke's Bay region where historically (1983-89) shortfins comprised 84% of total catch (Jellyman 1993). More recent data (1990-99) for the Bay of Plenty and Hawke's Bay Eel Return Areas indicate that shorfins comprise 71% of the total catch (Beentjes and Bull 2002).

The length frequency of fyke netted eels showed a gradual increase in numbers from the minimum length accessible to fyke nets (as smaller eels escape through the mesh). The minimum commercial size of 220g corresponds to a length of approximately 450mm and unlike intensively fished eel populations, the Mohaka River does not show a rapid decline beyond 500mm that typifies heavily exploited populations. The distribution of larger eels (>550mm) in the length frequency plot (not shown here) includes a substantial number of eels >700mm, which is usually indicative of lightly fished populations. Overall there appears to be a good robust population of smaller longfins and a healthy population of larger longfin eels. Thus the longfin eel population comprises an important reserve stock for the species and justifies the recent gazettement of the river as a non-commercial fishery. Generally maori prefer eels > 1 kg (equivalent to 700mm for long fins) and there is a good representation of this size group and larger in the Mohaka catchment. (Bonnett et al. 2007).

### 3.3.1 Potential Effects of a Proposed Hydro Dam at Karakiki

In response to the proposed hydro dam on the Mohaka River at Karakiki (discussed briefly in section 3.1.1), Bonnett et al (2007) undertook a preliminary assessment of potential impacts of a 50m high dam and hydroelectric scheme on the fisheries of the Mohaka River. The researchers concluded that inanga do not penetrate far inland and were unlikely to be affected by such a development. However other species of native fish (e.g. Koaro) would be affected and a fish ladder would be required if such a development were to proceed. Kahawai were unlikely to be affected by such a development provided a supply of gravel to the lower river is maintained.

A dam in the lower river would be a barrier to all migratory species. This would have significant implications for some species as it would prevent them from reaching their preferred habitat in the upper catchment. A dam in the lower river would block the upstream passage of juvenile eels (elvers) and would interfere with the downstream migration of sexually maturing adult eels. Overall, eel passage is a significant issue and it would be necessary to design and implement efficient systems to assist and promote eel passage in both upstream and downstream directions. It should be recognised that such designs are unlikely to be 100% effective and there may still be some impact on eel stocks in the Mohaka River if the development was to proceed. For other species it could be regarded as simply limiting their range. A more detailed survey of fish and fish habitat in the lower river was recommended by Jellyman (2006) to determine potential effects of a hydro electricity dam being constructed in the lower Mohaka River.

Additional to this work, Jellyman (2006) undertook studies of scales and otoliths from brown and rainbow trout in the lower reaches of the Mohaka River to determine whether the trout undertook migrations to sea. An important issue is whether this upstream fishery is sustained by recruitment

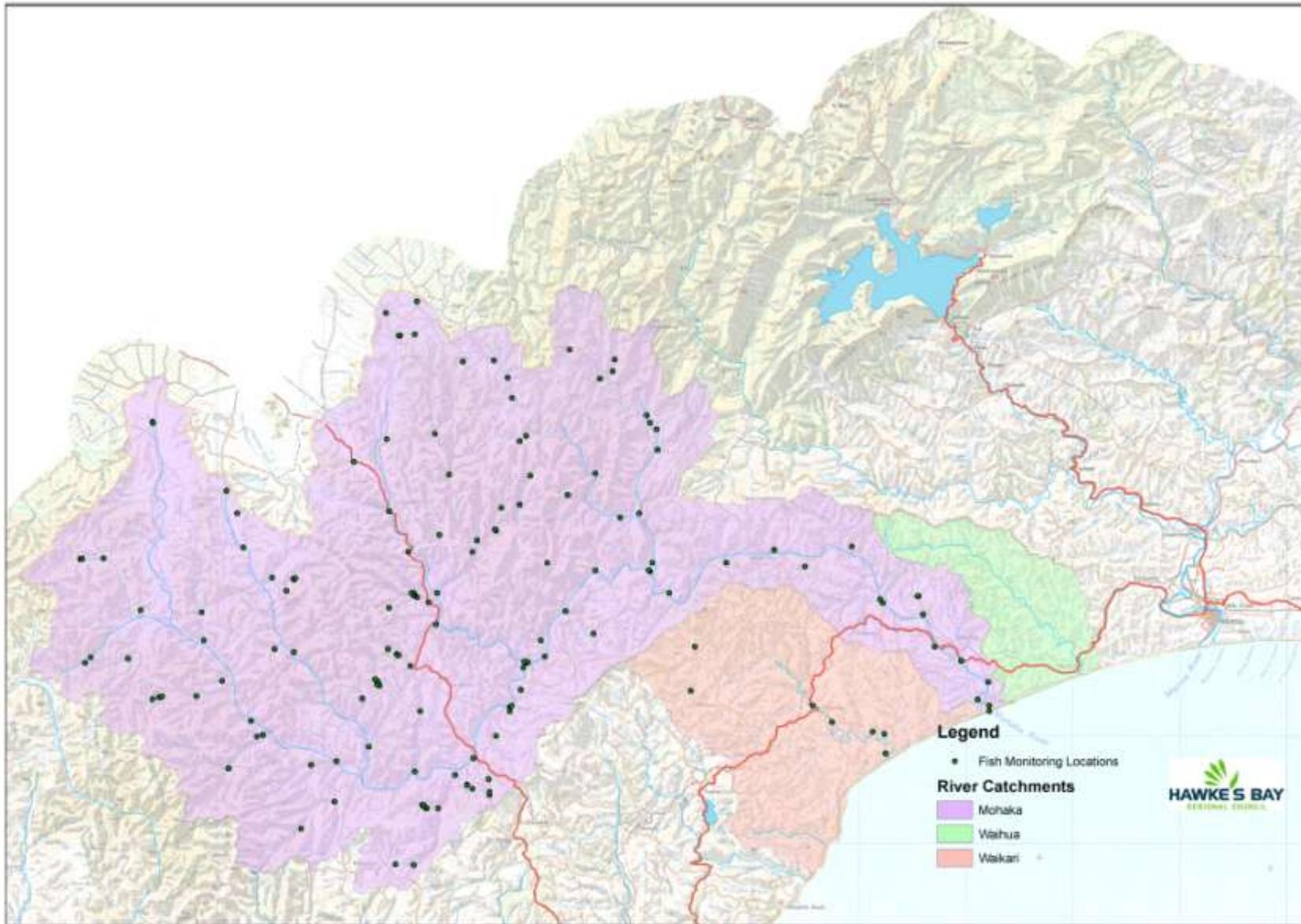
from downstream and hence whether the intervention of a hydro dam could significantly impact on trout stocks. If trout did migrate to sea then a fish pass would need to be constructed in the dam wall for the trout to minimise any adverse effect on the fishery.

By examining the ratio of strontium/calcium in the otolith (ear bone) of 12 trout, Jellyman concluded that the fish examined had not undertaken any migrations to sea. However the study acknowledged that owing to the small sample size, the alternative hypothesis that some otoliths might have shown marine signatures could not be categorically disproven and resolution of this issue to a reasonable level of certainty would require additional otoliths to be processed. Jellyman recommended further otolith studies to be undertaken to give greater confidence that trout do not migrate to sea from the Mohaka River.

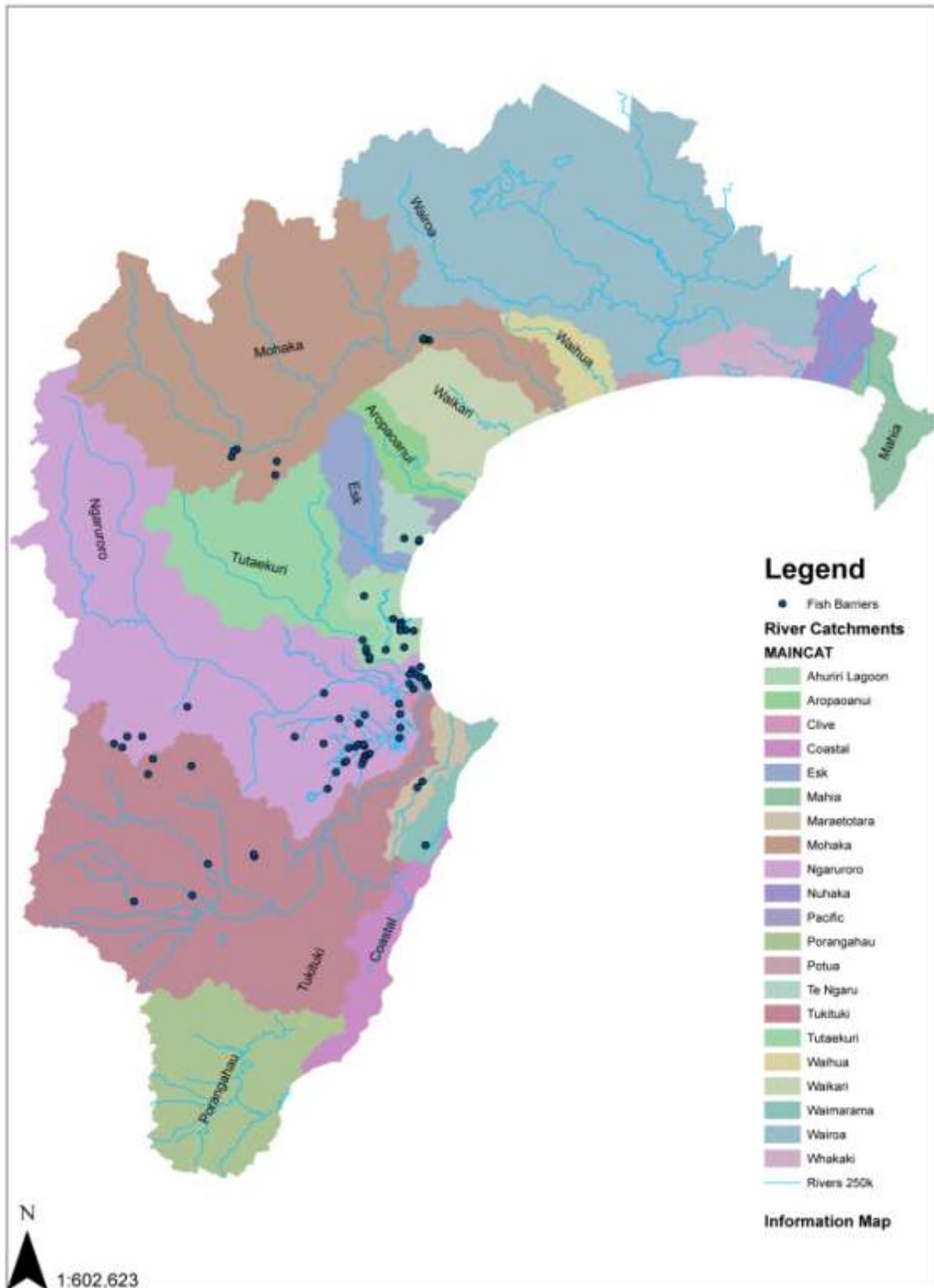
### 3.3.2 Known Barriers to Fish Passage

Different species of fish move between salt and freshwater (diadromous movements, a common feature of many New Zealand native species, McDowall 1988, 1990), while in river migrations also occur, usually for spawning, but also for feeding. If fish barriers are present (e.g. elevated culverts or weirs) then it restricts access to critical habitat for these fish to reproduce and feed.

Cameron (2010) undertook a comprehensive study on known fish barriers on public land within the Hawke's Bay Region. Map 5 shows the approximate locations of fish barriers identified in the report. The study failed to identify any significant barriers within the Waikari or Waihua catchments, while the barriers within the Mohaka catchment are either elevated culverts, dams or weirs. Details of the barriers are provided in Appendix 4. Although the survey is far from exhaustive, and only includes known fish barriers on public land, the study does highlight and describe a number of barriers in the Mohaka catchment that could be further assessed in regards to limiting fish passage. If found to be significant, then efforts could be made to improve fish passage past these points.



Map 4: Fish monitoring locations within the Mohaka, Waihua and Waikari catchments listed in the NZ Freshwater Fish database.



Map 5: Known fish barriers within the Hawke's Bay Region (Cameron 2010)

### 3.4 Terrestrial Ecology

The catchments identified in this scoping study fall within two ecological districts, namely the Maungaharuru and the Waihua ecological districts.

The Maungaharuru Ecological District is an area of mountainous and rolling hill country with steep bluffs and deep gorges, situated in western Hawke's Bay. The ecological district's vegetation can be described as diverse but uniform in that many of the remaining natural areas within the same ecological system are very similar to one another, but the difference in vegetation from one system to another is striking. This vegetation ranges from lowland podocarp broad leaved forests of matia, rimu, tawa and titoki through to alpine shrublands and grasslands of monoao and red tussock.

The Maungaharuru Ecological District has fared better than the rest of Hawke's Bay in that approximately 10% of its natural vegetation is protected in reserves. A further 10% of its area has been recommended for protection through the Maungaharuru Ecological District PNA report (Townsend, 1996). The reader is advised to consult this report for a complete description of threatened species contained within this district.

The Waihua Ecological District consists of the lowlands of northern Hawke's Bay. It extends from Tangoio near Esk in the south to Waikokopu in the east. The district includes lowland and coastal hill country, broad fluvial valleys, cliffs and coastal lagoons. Primary forest and wetlands, both coastal and inland now occupy only a small percentage of their original extent in the district and are diminished in quality. Burning, clearance, logging, drainage and the impacts of introduced mammals have all contributed to the loss of much of the district's natural features. The reader is advised to consult the Tinoroto, Waihua, Mahia and Matawai Ecological Districts Survey Report for the PNA programme (Whaley et al 2001) for a complete description of threatened species contained within this district.

Parrish (1988) published a report on the wildlife and habitat values of Hawke's Bay Rivers focusing on birds that includes some presence / absence data for the Mohaka River.

Lloyd (2007) undertook an assessment of terrestrial ecological values adjacent to the lower Mohaka River on behalf of Meridian Energy. Lloyd provides the following historical account of native vegetation within the Mohaka River catchment.

"After recovering from deposition by tephra and pumice following the taupo eruption some 1800 years ago, most of the Hawkes Bay region's lowland temperate zone would have been covered by extensive podocarp/broadleaved forests (Townsend 1996; Whaley et al. 2001). Coastal lowlands (largely in the Waihua Ecological District) would have supported broad leaved forest with a range of canopy species including titoki (*Alectryon excelsus*), kohekohe (*Dysoxylum spectabile*), karaka (*Corynocarpus laevigatus*), tawa (*Beilschmeida tawa*) and nikau (*Rhopalosylis sapida*). Fertile alluvial terraces would have supported podocarp-rich forests dominated by Kahikatea (*Dacrycarpus dacrydioides*), mati (*Prumnopitys taxifolia*), and totara (*Podocarpus totara*). With increasing distance from the coast, kohekohe, karaka and nikau would have become less common. As elevation increased, lowland forest would have been replaced by montane forests dominated by rimu (*Dacrydium cupressinum*) and taxa with silver beech (*Nothofagus menziesii*) and red beech (*Nothofagus fusca*) in cool, wet upland forests and black beech (*Nothofagus solandri*) on dry ridges in lowland sites. Large areas of these forests particularly the lowland components were subsequently burned by Maori for agriculture and to provide access followed by more systematic vegetation clearance by European settlers to create farmland (Gurthri-Smith 1999; Grant 1996; Townsend 1996; Whaley et al 2001)."

Lloyd also provides an update on current indigenous vegetation:

"Currently Kanuka (*Kunzea ericoides*) is the commonest indigenous canopy tree in both the Tiniroto and Maungaharuru Ecological Districts, having regenerated following historic burning. More recently exotic forest plantations have been established and cover extensive areas immediately north of the study site (Willowflat). Primary indigenous forest now covers only 5.3% of the Tiniroto Ecological District (Whaley et al. 2001), where vegetation clearance has occurred on

the most productive land. The most extensive stands of primary forest remaining in the Tiniroto Ecological District comprise tawa forest, conifer/tawa-beech forest, and conifer/tawa forest. Advance secondary forest, comprising stands of Kanuka incorporating well established podocarps and broadleaved trees, covers only 1.3% of the Tiniroto Ecological District, while just over half of the indigenous vegetation (8.3% of the tiniroto ED) is secondary forest dominated by Kanuka and manuka at lower elevations and broadleaved scrub in upland sites (Whaley et al. 2001). The Waihua ED, which occupies coastal lowlands and hill country immediately to the east of the study site (Willowflat) has been more highly modified and primary forest cover now covers only 1.3% of the district with similar proportions of advanced secondary and secondary forest to the Tiniroto ED (Whaley et al 2001).

Most of the indigenous vegetation in the study area (Willowflat) comprises Kanuka dominant forest on steep slopes and alluvial terraces but small remnants of podocarp/broadleaved forest occur on alluvial terraces and slopes.

The areas and proportions of existing indigenous vegetation that have formal protection within the Tiniroto ED are summarised by Whale et al (2001). Indigenous vegetation totalling 12,567 ha and covering 4.3% of the district has existing protection. Protected areas are concentrated on steeper country, and the largest areas comprise conifer/beech forest in higher rainfall upland parts of the district. Of the primary forest types about half of the existing conifer/tawa forest and a quarter of the existing tawa forest, were formally protected at the time of the Protected Natural Areas Programme (PNAP) survey, while conifer/tawa-titoki forest, conifer/tawa-kohekohe forest and tawa-titoki/kohekohe rest lacked any formal protection. Very little of the existing advanced secondary forest types were protected in 2001, but large areas of Kanuka forest and manuka-kanuka scrub (20-30% of the total cover of these types) had formal protection.

Four nationally threatened or uncommon native plants were observed during the survey, three of which occur in low-elevation habitats associated with the Mohaka River. Regionally significant populations of five additional plants were also recorded, all in similarly low elevation habitats. All of these low elevation populations would be inundated by the development being considered. Two nationally threatened or uncommon birds (kereru and black shag) occur in the study area. Local populations of kereru and other frugivorous birds may be adversely affected by loss of mature podocarp/broadleaved forest. The author concludes that it would be difficult to avoid or remedy adverse effects on the terrestrial ecological values that have been identified, but a wide range of mitigation measures exist at the site and elsewhere and combinations of these could help to balance adverse effects of the project.”

### 3.5 Hydrology

The available river flow data for the Waikari, Waihua and Lower Mohaka catchments is very limited. There are currently two sites with reliable long-term river flow records (detailed in table 13). Both sites are operated by NIWA. Live data can be captured for the Tahekenui Stream via a website: <http://edenz.niwa.co.nz>. Data from the Mohaka River at Raupunga can be obtained by phoning NIWA in Hamilton.

Site	Catchment	Catchment Area (km <sup>2</sup> )	Length of Flow Record
Mohaka River at Raupunga	Mohaka	2370	01-Mar-1957 to Present
Tahekenui Stream at Glenstrae	Waihua	20.6	24-Mar-1975 to Present

**Table 13: Flow recorder sites within the Mohaka and Waihua Catchments**

There are 22 sites which have manually gauged river flow records (Waldron, HBRC pers comm 2010). These records start in 1938 and are very intermittent over the years. River catchments with a greater availability of long-term flow records and gauging data can often be modelled to correlate long-term flow records to other reaches or tributaries in the catchment. The Waikari, Waihua and Lower Mohaka catchments do not currently have enough data to do this (Coulson, HBRC pers. com. 2010).

The following options could be investigated and undertaken to increase river flow data in these catchments:

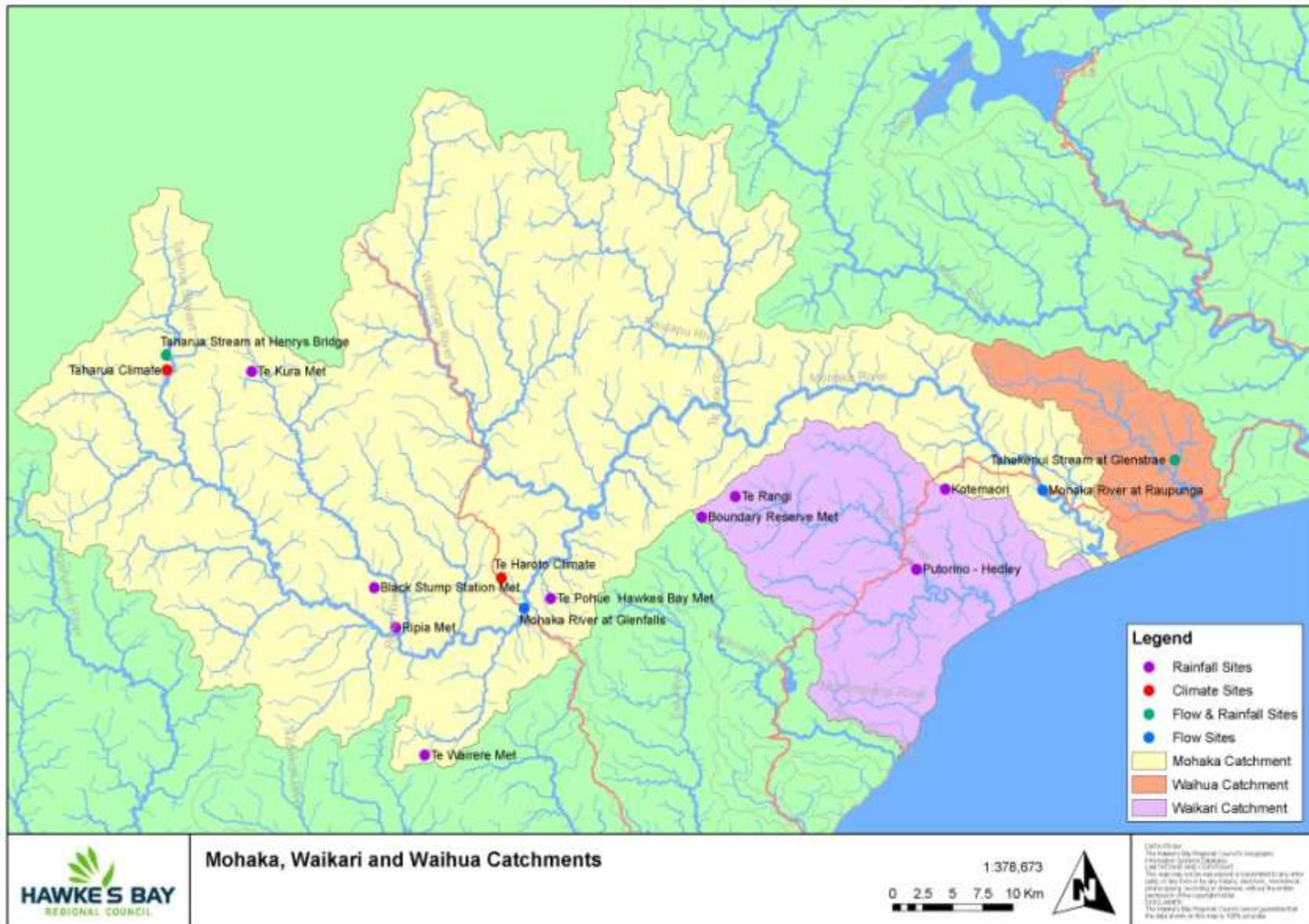
- Undertake a concurrent gauging survey – use concurrent gauging data to build correlations between the site of interest and the two NIWA sites. Use the correlations to produce correlated synthetic flow records.
- Establish three new recorder sites to produce continuous rated flow records (lower Te Hoe, Waikari and Waihua Rivers).
- Undertake rainfall-runoff modelling to produce synthetic flow records.
- Use the NZ River Environment Classification (Snelder 2004) to estimate key flow statistics for rivers/streams in these catchments.

A map of water flow and climate stations are shown on the map overleaf (Map 6).

### 3.6 Cultural Health

Little is known about the cultural health of the Mohaka, Waihua or Waikari catchments. Cultural health assessments of the catchments need to be undertaken to address this knowledge gap. Current tools available from the Ministry for the Environment include the Cultural Health Index (Tipa and Tierney 2003, 2006) and the state of the Takiwā (Pauling et al 2007). The advantage of the State of the Takiwā method is that it includes a database that is freely available. A further advantage is that the method can be applied at a number of scales (it could assess a single species of fish, or the entire fishery or the health of an entire catchment). The Ngati Pahauwera Trust need to research both methods and decide on the most appropriate method to use. It is possible that the agreed method may need adapting to local hapu concerns.

A social impact assessment for the proposed Kakariki Hydro Development was undertaken by Talyor Baines and Associates (2006). From the range of interviews conducted, the authors concluded that the potential downsides of the hydro electric development proposal loom much larger in people's minds than the potential development opportunities that might be associated with it. Furthermore, the attitudes of those interviewed ranged from strong opposition to being neutral and prepared to keep an open mind to the basic hydro electric proposition.



Map 6: Flow, Rainfall and Climate Monitoring Stations within the Catchments.

#### 4.0 LANDUSE PRESSURES

Council to date have undertaken a number of erosion control plans (ECPs) in the area covered by this scoping study. Two ECP's have been undertaken in the Waihua Catchment (W. Morunga and J & J Martin); one in the Waikari Catchment (D McIntosh); and three in the upper Mohaka Catchment (Poronui Station, Lochenvaar Station and Country Practice).

An ECP contains a simple photo/drawing of the farm showing paddocks and erosion control work planned for each area. It defines priorities and a short term budget. It is written in partnership with the landowner so that he/she uses it annually to plan tree planting. Some properties carry out regular or irregular planting work, but may not have a plan of the farm showing paddocks and erosion control work planned for each area.

Council has undertaken a series of catchment farm plans (or environmental farm plans) which are more extensive than a simple ECP. Farm plans are used as a tool to assist and improve the effectiveness of work that is already proposed. An extensive Environmental Plan for Paroa Station was produced by Council in 1998 (Stokes 1998). Paroa Station is a 1703 Ha sheep and beef farm located at Raupunga in the Mohaka and Waihua River Catchments. The plan links the environmental variables of soil, slope, rock type, erosion, vegetation and land use with land management options and soil conservation measures. The main physical limitation of this property was found to be erosion with a less dominant limitation of soil. This is the only environmental farm plan that has been done within the geographical boundaries of this scoping study. The reason so few erosion control plan and environmental plans have been done within the region is because they require owner buy in.

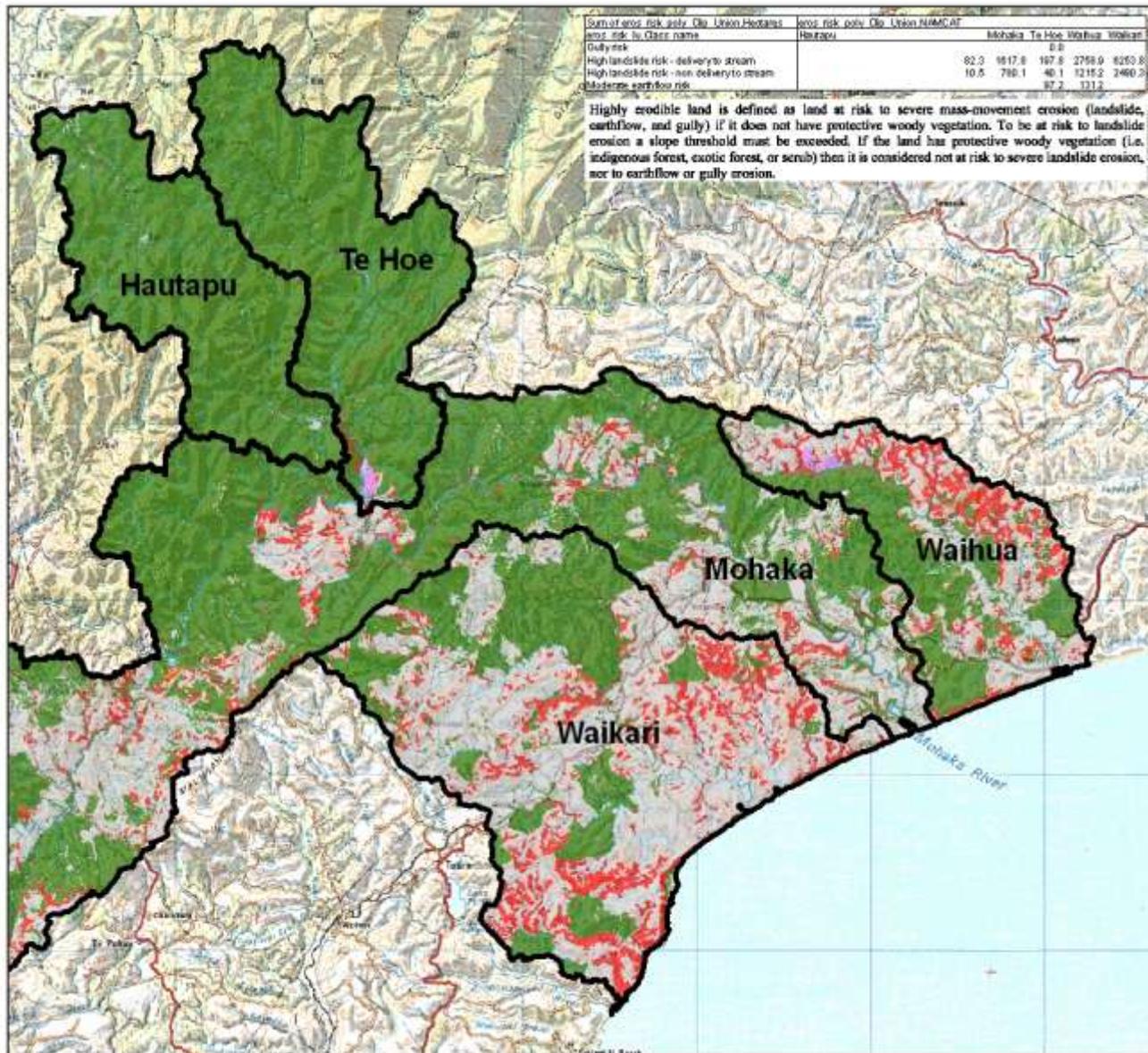
All three catchments have seen extensive growth in the area of forestry. In percentage terms, the Waihua Catchment has seen the greatest change, followed by the lower Mohaka Catchment then the Waikari Catchment. Each farm planted in trees has a very significant effect on the amount of sediment entering the rivers and streams (especially the Waihua Catchment which has the softest and most erodible rock type). There is also some very soft sandstone on farms up the Waikari River, an area that is prone to erosion and could do with more conservation and erosion remediation work. Map 7 gives a detailed overview of areas susceptible to landslip and soil erosion throughout the area of the scoping study.

Of the three catchments, the upper Mohaka is the only catchment that is subject to intensive dairying. The extent and effects of this practice were discussed earlier in the report (refer to section 3.1).

No studies have been undertaken within the Mohaka, Waikari or Waihua river catchments with respect to forestry operation effects on stream water quality and ecology. However, an extensive study has been undertaken in the Pakuratahi River catchment (approximately 20km north of Napier) which was a paired catchment (forestry vs pasture) study. The key findings of this study showed that for a highly erosive catchment:

- Mature forest produced 6% less water than one in pasture
- Pasture produced 4 times more sediment than mature forest
- During harvest there was a 6 fold increase in suspended sediment yield
- Sediment yield reduced to mature forest levels within 3 years of harvest
- During harvest, native fish and macroinvertebrate communities became similar to pasture but returned to pre-harvest levels within 3-5 years.
- These findings can relate to more than 700,000 ha of North Island hill country

For further information, refer to Eyles and Fahey (2006).



**Legend**

**Erosion Risk**

**Class\_name**

- Gully risk
- High landslide risk - delivery to stream
- High landslide risk - non delivery to stream
- Land
- Moderate earthflow risk
- Water
- Watercourse bare ground
- Woody Vegetation

Note: Mohaka catchment totals extend from the Mouth of the Mohaka river to the confluence of the Te Hoe river.

**Erosion Risk**



1:200,000



DATA FROM: Farm information obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

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Map 7: Erosion risk areas

#### 4.1 GIS Analysis Opportunities

The Hawke's Bay Regional Council has a number of geographical information system (GIS) layers that can be explored and analysed to give greater understanding of land uses within the scoping study region.

*Note: Depending on the question at hand, the Council has the ability to analyse and interrogate each of these GIS layers to address specific questions that may be asked by the Ngati Pahauwera Trust. At present, the types of analysis that could be carried out are extensive. Some detailed discussion and direction is therefore required to determine the specific question to direct the analysis, the applicable datasets to use and the area and scale that the analysis would be carried out.*

##### LENZ – Land Environments of New Zealand

Land Environments of New Zealand (LENZ) describe an environmental classification of New Zealand that is designed to provide a framework for addressing a range of conservation and resource management issues (Leathwick et al 2003).

The following information has been taken from the Landcare Research New Zealand website (<http://www.landcareresearch.co.nz/databases/LENZ/about.asp>) -

LENZ (Land Environments of New Zealand) is an environmental classification intended to underpin a range of conservation and resource management issues. LENZ was originally envisioned as a framework for conservation management that would take advantage of the natural relationship between the environment and species distributions. Rather than occurring randomly, species tend to occur in areas having similar environmental conditions. As a consequence, similar environments tend to support similar groups of plants and animals, provided they have not been substantially modified by human activity.

LENZ capitalises on the species-environment relationships by identifying climatic and landform factors likely to influence the distribution of species. LENZ uses these factors to define a landscape classification that groups together sites that have similar environmental conditions. Such a classification can then be used to indicate sites likely to have similar potential ecosystem character - not necessarily the same in all respects but likely to have similar groups of species and similar biological interactions and processes.

One major advantage of this approach, as opposed to directly mapping land cover for example, is its ability to predict the potential character of sites where natural ecosystems have been substantially modified (e.g. by land clearance or fire) or replaced by introduced plants and animals (e.g. pests and weeds).

Although LENZ was originally envisioned as a tool for biodiversity management, it has a much wider application. This is because the environmental factors that control the distributions of many land based plants and animals (temperature, water supply, availability of nutrients, etc.) are also factors that provide major constraints on human land uses such as agriculture, horticulture, and forestry.

Some applications which use LENZ include

- assessing the biodiversity value of surviving natural ecosystem remnants and their ability to represent historic biotic patterns;
- identifying the most efficient use of limited financial resources for biodiversity management, including management of protected natural areas and other areas of land with high biodiversity values;

- identifying sites where similar problems are likely to arise in response to human activities, or where similar management activities are likely to have a particular affect;
- identifying the geographic extent over which results from site-specific studies can be reliably extended;
- providing a framework for regulatory activities and reporting on the state of the environment;
- setting targets for restoration projects, including identifying suitable sources of plants and animals for re-establishment;
- identifying environments throughout the world that are similar to New Zealand's environments to assist with predicting what new harmful organisms could successfully establish and spread in New Zealand if they were to arrive;
- optimising the management of productive land uses, including locating optimal sites for particular crops or cultivars.

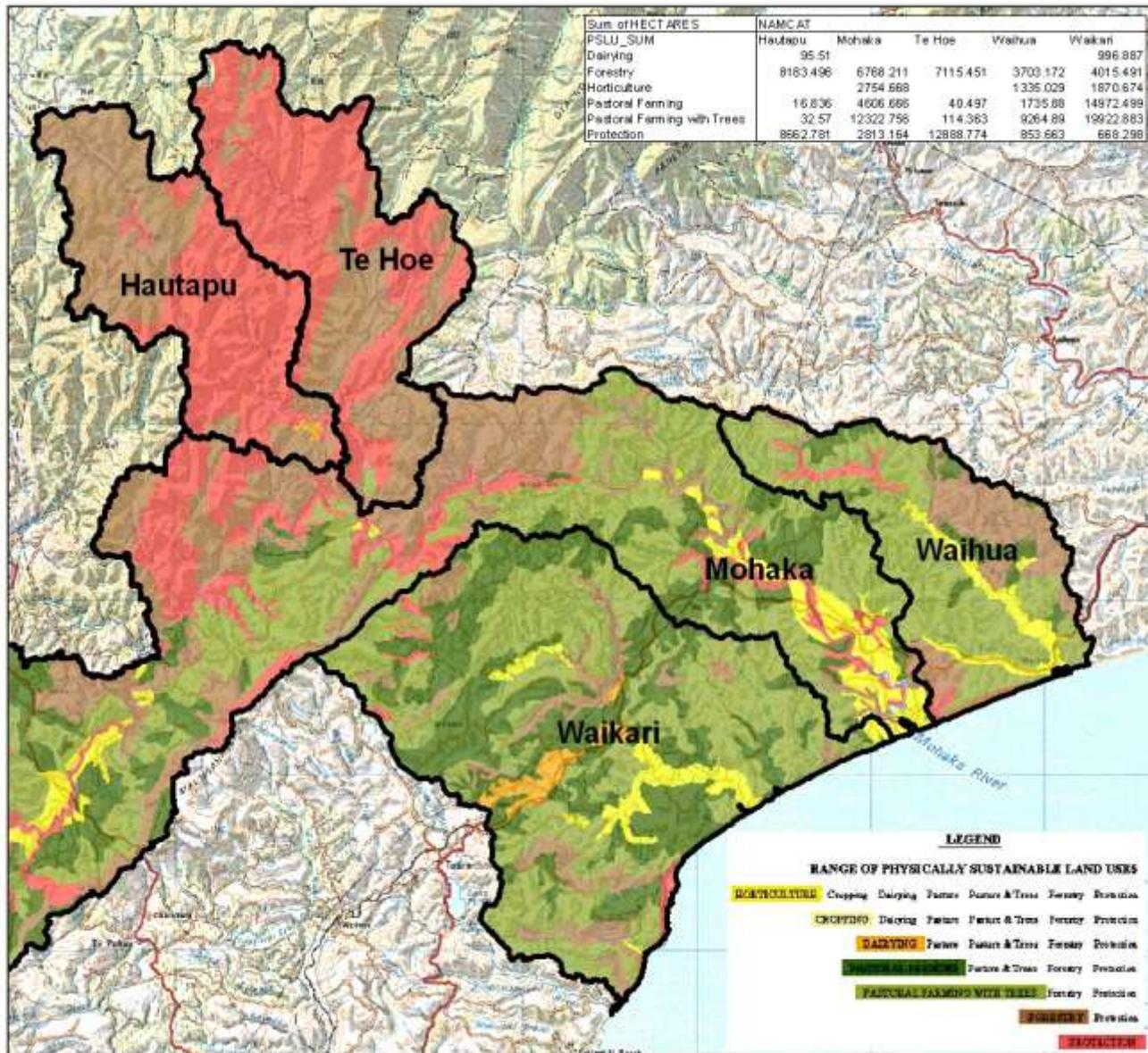
There is opportunity to use the LENZ datasets as a management tool to undertake case studies which look at relationships between LENZ environments and ecosystems. For example finding sites suitable for specific crops or focussed restoration of degraded ecosystems.

#### NZLRI –New Zealand Land Resource Inventory

In 1999 the Hawke's Bay Regional Council, lead by Garth Eyles, classified the Hawke's Bay Region into sustainable land use classes. This provided the Land Management team within council a framework to encourage land users, such as farmers, to use land more sustainably. The classification is derived from The New Zealand Land Resource Inventory (NZLRI). The classes are based on general land use categories, these being:

- (i) Horticulture
- (ii) Cropping
- (iii) Dairying
- (iv) Pastoral farming
- (v) Pastoral farming with trees
- (vi) Forestry
- (vii) Protection

Map 8 shows the physically sustainable land use classes estimated for the geographical confines of the scoping study. Note the sustainable land use classes have been derived from what is known about the topography and land use capability of each area. No one single land use is most suitable for entire catchments; rather areas are shaded within each catchment according to what may be most suitable. It is also possible that a number different land uses may be suitable for a specific land. These data could provide an opportunity to review existing land use practices in conjunction with council's Land Management team.



**Legend**

- Horticulture
- Cropping
- Dairying
- Pastoral Farming
- Pastoral Farming with Trees
- Forestry
- Protection

Note: Mohaka catchment totals, extend from the Mouth of the Mohaka river to the confluence of the Te Hoe river.

**Sustainable Land Uses**



DATA FROM: For information, obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

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Map 8: Sustainable land use classes within scoping study catchments

### CLUES – Catchment Land Use for Environmental Sustainability – Assessing the Effects of Land Use Change on Water Quality

The Ministry of Agriculture (MAF) in association with the Ministry of the Environment (MfE), engaged NIWA & other contractors to provide a quantitative method to assess the effects of land use change on water quality and socio-economic factors at regional or national level. The end result was a modelling system called CLUES – Catchment Land Use for Environmental Sustainability.

The modelling framework allows users to develop and simulate the effects of land use change on stream water quality. In addition it integrates other components. These being:

- Prediction of annual average stream loads of total nitrogen, total phosphorus and E. coli.
- Calculates the nitrogen budget for 5 horticultural enterprise scenarios
- Computes nutrient leaching for various land uses (dairy, sheep/beef lowland, sheep/beef hill country, sheep/beef high country and deer)
- Estimates economic output from different land use types (pasture, horticulture, forestry & cropping) in terms of cash farm surplus, total GDP and total employment from that land use. These calculations are based on MAF farm monitoring models.

The resources required to undertake CLUES modelling is significant but if done correctly, the model provides a powerful tool for determining the effects of land use changes on surface water quality as well as providing a modelling framework through which scenarios can be investigated that target rehabilitation and sustainable land use practices.

Further information on CLUES can be found on the Ministry for Agriculture and Forestry website – <http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/clues/>

## 4.2 Extraction of Natural Resources

The areas Council has information with respect to gravel management in the Lower Mohaka and Waikari rivers is located in Council's gravel declaration database which holds extraction records for all rivers and has records of information for the Mohaka from approximately 1960 onwards. Interrogating the database showed gravel extraction records for the Mohaka River but nothing for the Waikari or Waihua river catchments. Gravel has been extracted from the Mohaka River since the 1930s.

The Mohaka River is a principal source of high-quality gravel for the central East Coast region. The nearest alternative sources of gravel of equivalent high grade quality are the rivers of the Heretaunga Plains area.

A social impact assessment report by Taylor Baines and Associates and Tureiti Moxon (2006) indicate that roads in this part of the country appear to require relatively high levels of maintenance due to the nature of the underlying rock substrate and the high levels of use by heavily laden trucks.

There are several extraction sites with access permits, but the largest extraction has occurred from sites downstream of Raupunga. Total extraction rates from the river averaged approximately 32,000 m<sup>3</sup>/yr from 1963-1995, but since 2000 averaged approximately 23,000 m<sup>3</sup>/yr. The reduced take partly reflects a waning re-supply to the extraction beaches from upstream and partly a market-driven preference for the older, more clay rich gravels found in Pleistocene terrace deposits.

Recent information provided by HBRC indicated that the extraction limit was now 40,000 m<sup>3</sup>/yr. Bedload transport calculations suggest that the current average annual bedload is in the range of 12-24000 m<sup>3</sup>/yr, but the river has the capacity to transport 78-164000m<sup>3</sup>/yr on average.

A 1995 assessment by Hawke's Bay Regional Council recommended that an extraction rate up to 65,000 m<sup>3</sup>/yr should be sustainable from the river downstream of Raupunga.

Extraction rates estimated by the Hawke's Bay Regional Council are not comparable with the extraction rates reported by Taylor Baines and Tureiti Moxon (2006) The reason being that the latter report is dealing in tonnes/yr whereas HBRC's gravel extraction rates are estimated in cubic metres/year.

The Taylor Baines and Tureiti Moxon (2006) report states that "Gravels from the higher terraces contain higher clay content, and these tend to be used for the extensive network of the Districts unsealed roads'. While this is an important measure of what the gravel resource is used for, many of the upper terraces are generally land based quarries that have little influence on river bedload or geomorphology.

Hawke's Bay Regional Council reports (1991, 1995) note that the river network can be classified into gravel storage and transfer zones. The main gravel storage areas reflect reaches of low river gradient and a good supply of upstream bedload and tend to be found in the mid reaches. The Te Hoe confluence represents the largest sediment storage area as a result of both abundant bedload supplies from the Te Hoe and Mohaka mainstem and hydraulic conditions. Other lesser gravel storage areas include the Waipunga, Makahu and Mangatutunui confluences as well as beaches near state highway five in the Waipunga Gorge area near the Te Hoe Logging camp and the Hautapu River near Ngatapa Station. The low gradient between Raupunga and the coast also provides for a storage zone with gravel collecting on point bar reaches. HBRC(1995) note how floods can deposit several metres of gravel at most of these locations with some of this deposited material being subsequently moved resulting in incised river terraces.

HBRC (1991) estimated the storage on active gravel beaches upstream from the Willow Flat area at 2.375 million m<sup>3</sup> (1.05 million m<sup>3</sup> of this at the Te Hoe confluence), with an additional 0.769 million m<sup>3</sup> stored on beaches along the lower Mohaka mainly between Raupunga and the coast. They estimated 10.2 million m<sup>3</sup> of 'red metal' gravel stored in the high terraces in the Raupunga area, with a further 12.1 million m<sup>3</sup> from McVicars downstream to Tarawera farm. HBRC (1995) updated some of these storage figures, estimating a total of 4.328 million m<sup>3</sup> on beaches upstream from Willow Flat, with 3 million m<sup>3</sup> of this total at the Te Hoe confluence.

These storage figures are several times larger than earlier estimates of the recoverable gravel resource by Clark (1984). Clark estimated 250,000 m<sup>3</sup> for the reach 9km upstream of the SH2 bridge at Raupunga to the mouth, and 150,000 m<sup>3</sup> in the Te Hoe confluence area. Hawke's Bay Catchment Board (1986) noted that much of the storage in the lower rivers was removed (by extraction) in 1983 and 1984, but was replaced again by the 1985 flood. The difference between the Clark(1984) and HBRC(1991) estimates probably related in part to flood-by –flood storage changes in part to how they were estimated; Clark's estimates may be more conservative because he focussed on recoverable gravel.

#### 4.2.1 Extraction and Replenishment Rates

Hawke's Bay Catchment Board (1986) stated that beach replenishment (where gravels are generally taken) during floods had kept pace with extraction rates which averaged 20,000 m<sup>3</sup>/yr in the lower Mohaka and 7-10,000 m<sup>3</sup>/yr at Pakatutu and at SH5 over the period 1964 – 1986. These extractions would appear to have been sustainable in the sense that storage on river beaches was maintained on average, that is to say that the erratic replenishment from floods meant that replenishment and extraction were not in balance on a year by year basis (HBCB 1986).

HBRC (1995) updated the extraction figures, noting an average extraction rate of 31,700 m<sup>3</sup>/yr since 1963 from the whole river, with the majority taken from between Raupunga and the mouth.

More recently extraction rates from the lower Mohaka have averaged 23,113 m<sup>3</sup>/yr from 2000 to 2005, ranging from 11628 m<sup>3</sup> in 2000 to 39605 m<sup>3</sup> in 2003 (Vince Byrne, HBRC). These figures concur with those sort from the commercial extractors QRS (Hicks et al 2007) however their view

was that the gravel resource in the lower river was being depleted with time, more often is was becoming necessary to venture into the river to win gravel rather than take it from dry beaches, and they were having to chase the gravel further upstream.

QRS also indicted that beaches tended to be replenished by large floods such as Cyclone Bola while the more common floods (with peak discharges in the order of  $1000\text{m}^3/\text{s}$ ) only restored relatively small amounts of gravel.

QRS also note that there were potential extraction sites that could not be accessed either because of physical access problems or permission from local iwi. In summary, QRS held the view that the current extraction rates of  $20,000\text{ m}^3/\text{yr}$  were not sustainable given current re-supply rates from upstream and they were focussing more on terrace gravels, partly because of this supply issue but also because the terrace gravels were more suited to their current market requirements.

Hansen (2008) highlighted some pertinent points with respect to the NIWA study (Hicks et al 2007) that deserve comment here:

*NIWA have used Wilcock-Crowe models to determine a current and upper range of volumes varying between  $14300 - 23800\text{ m}^3/\text{yr}$  and  $77,800 - 163900\text{ m}^3/\text{yr}$  respectively. All formulas are applied to a discharge rating with assumptions made for various factors, hence the wide range of average bedloads it is not surprising that there will be a degree of difference between the volumes calculated. Due to this expectation other mechanisms such as visual inspections, aerial photographs and rates of replenishment are also used a means to determine what is actually happening on the ground and this information also forms part of the decision making process annually. The current actual annual extraction rate of approximately  $27000\text{m}^3/\text{yr}$  is considerably less than the allocated volume and falls within an acceptable range with respect to the theoretical sustainable limits calculated by various means. The question is whether the upper allocated limit, varying between  $40,000 - 60\ 000\text{ m}^3/\text{yr}$  is too high and if extraction was allowed at this upper limit for a period of time whether this is sustainable. Our approach to date has been to consider the variation on the upper limit on a year by year basis, taking account of annual influences such as floods, extraction beach levels and demand. Too date there have been no indicators to suggest that this approach is significantly flawed or causing adverse effects warranting a significant change in direction. Having said that we are also supportive of any initiatives that add to or improve our knowledge of these very dynamic processes.*

QRS (Quality Roading & Services) as a local contractor have also provided information for the report with some statements being at odds with our records or understanding. I would make the following comments.

1. QRS's take from the lower Mohaka has ranged from  $15,000 - 30,000\text{m}^3/\text{yr}$  in recent years, while other extractors were taking  $5,000\text{m}^3/\text{yr}$ , with the average take being  $20,000\text{m}^3/\text{yr}$ .

*Comment: QRS's largest extraction year was 2003/04 @  $23808\text{m}^3$  and they have averaged  $13,646\text{m}^3/\text{yr}$  since their commencement in the river in 1998. QRS are also not privy to other extractors volumes so the comment about the  $5000\text{m}^3$  is also not correct. The annual average extraction rates for the lower section of Mohaka River in the 4 last 20 h years has been  $26,660\text{m}^3/\text{yr}$ .*

2. QRS believe the gravel resource is being depleted with time, with the need to venture into the river to win gravel and chase gravel upstream.

*Comment: QRS has advised that this statement only relateds to beaches they work on, not as a comment on the whole system and has only happended in the last 2 years. For this period the statement would be correct as a larger volume has been extracted over the past 2 years with the absence of major floods. However this comment relates to a period too short to be representative of longer term trends and would be misleading with respect to overall supply.*

3. QRS;s statements about beaches being replenished by floods, the depth of gravel, potential extraction sites not used and accesss are consistent with our knowledge.

4. QRS currently take 50-60,000 m<sup>3</sup>/yr from terrace gravels and quarries, with specific mention to Mossman's quarry.

*Comment: QRS has confirmed that the 50-60,000m<sup>3</sup> was the volume from all quarries in the Wairoa District and that Mossman's quarry has never been used for roading contracts. Land based gravel extraction is a land use activity managed by Territorial Local Authorities and as such our Council has no involvement or control over land based extraction.*

5. In summary, QRS held the view that current extraction rates of 20,000m<sup>3</sup>/yr were not sustainable given re-supply rates from upstream.

*Comment: QRS has confirmed that this statement only relates to beaches extracted by QRS and was not relating to the total volume. This also appears to relate to a very short time period of only the past 2 years and may have some relevance to this period. However we believe long term sustainability needs to be related to much greater periods of time where trends and responses to floods can be adequately considered.*

*QRS's comments need to be taken within the context given, which is a relatively short time frame and very site specific to their organisation. In our opinion these comments are not necessarily representative of the bigger picture.*

*In summary some of the information included in the NIWA dam report needs to be clearly considered within the specific context given, such as comments from QRS particularly when considered alongside longer term trends or information.*

There have been no cross sections surveyed in the Mohaka River (Hicks et al 2007). The reason being that the Mohaka River has a mudstone base, therefore the gravels are highly mobile and a cross section at one point in the river could indicate that gravels are in short supply whereas the same assessment conducted further downstream may indicate a plentiful supply of gravels because the river has deposited them to that point. The Mohaka River is unique when compared to most other Hawke's Bay Rivers from which gravels are taken (eg. Ngaruroro, Tukituki) in that it is not a braided river system. This poses difficulties in assessing the supply of gravels using cross section information.

#### 4.2.2 Water Takes

Interrogation of the HBRC Daisy Database shows that there are 6 consented water takes within the Mohaka catchment, 2 consented water takes within the Waikari catchment and one consented water take within the Waihua catchment. There is one discharge to water consent within the Mohaka catchment. Full details of consented activities occurring within the catchments are provided for in Appendix 1.

#### 4.3 Natural Hazards

Hawke's Bay is susceptible to a number of natural hazards. For example: flooding, landslide and earthquake. Council has a number of datasets (maps), which can assist communities to be aware of and be prepared should a natural disaster happen. Some uses of these datasets would include:

- Land susceptible to liquefaction in an earthquake.
- Land at risk to erosion either through landslide, earth-flow or gully erosion
- Location of known active earthquake fault lines.

There are active fault traces crossing the lower Mohaka River, Waikari, and Waihua Rivers as shown in Appendix 3. The Ruahine Fault is thought to have ruptured every 1,000-5,000 years accompanied by a 2-5 metre movement of the land, and the Mohaka Fault is thought to have ruptured every 1,000 years accompanied with a 3.5 metre movement of the land. The Rangiora

Fault is thought to have moved at a similar rate to the Mohaka Fault. Both the Waiohau Fault and Whakatane Fault are thought to move approximately every 2,000 years.

When any of these faults move, there will be accompanied ground shaking, which is ranked at a Modified Mercalli (MM) intensity of 8.8 expected in the Tutira area at least every 142 year return period (10% probability of exceedance in 15 years); and a MM intensity 9.4 at least every 475 years (10% probability of exceedance in 50 years). For clarification, at an MM intensity of 8 driving is difficult, ordinary masonry is damaged, chimneys and towers fall, and cracks appear on steep slopes and in wet ground. At MM intensity 9 there is general panic, masonry and foundations are damaged or destroyed, landsliding generally occurs on steep slopes, cracking of ground is conspicuous, and liquefaction (loss of bearing strength where structures sink into saturated silty or sandy soils) will occur.

There is also a risk of tsunami along the coast line in this area, which is supported by historical reports, such as a tsunami wave reported in the Waikari River after the 1931 earthquake. Future earthquakes could generate waves of 4 metres or more which could result in tsunami travelling up any of these coastal rivers.

*NB: The Hawke's Bay Regional Council has never commissioned specific earthquake hazard information for these rivers, and this information summary has been compiled from GNS Science reports for the wider Hawke's Bay.*

A more detailed analysis of natural hazards is provided in Appendix 3.

#### 4.4 Biosecurity Risks

The Hawke's Bay Regional Council's animal pest control efforts within the rohe of Ngati Pauhawera are largely confined to Opossum control for the purposes of managing livestock disease only. While this is effective in controlling the spread of diseases like tuberculosis, it is not effective in controlling all animal pests for the purposes of protection of native biodiversity.

The current Opossum control operations are likely to lead to boom and bust cycles in that once Opossum numbers are kept at a low number, foliage thrives giving rise to a good seed fall for rats which are an important food source for mustelids (stoats, ferrets and weasels). This gives rise to a fall in rat numbers and an increase in predation of native birds and eggs giving rise to a decline in native bird populations. Once bird numbers fall the mustelid population may fall giving rise to a second boom in the number of rats and so the cycle continues.

The Regional Council is currently scoping the potential for an extended predator control programme with the intent of extending this kaitiaki role to the local community (Dickson, pers comm.).

A brief from Owen Harris (Team Leader Biosecurity) follows:

Following the designated boundaries as instructed on the day of discussion i.e. Catchment of the Mohaka River from the coast up to and just past the Te Hoe River confluence, all of the Te Hoe River catchment, part of the Hautapu River and all of the Waihua, Waikari, Moeangiangi and Aorpaoanui River catchments, the total area involved is around 120,000 hectares.

Over this 120,000 hectares there is a very proactive possum control programme running between the Hawkes Bay Regional Council and the Animal Health Board. There are no fewer than 12 projects extending in whole or part of within the scoping area.

Possums are the main target species, however feral pigs and ferrets are also collected from surveys within the area to help determine disease status i.e., bovine tuberculosis (Tb) in the wildlife.

The Animal Health Boards objective over these projects is to maintain possum population levels at or below 2% residual trap catch (RTC) within the farmed land and 3% within the deep bush blocks.

Post operational monitors are applied to a National Protocol i.e. For every 100 trap nights applied no more than 2 possums are to be caught or a re-work is applied, 3 for the deep bush blocks.

Subject to budget limits, the 15 projects within this area are worked every other year, with the exception of the deep bush blocks and as these are controlled by 1080 aerial baiting they are controlled once every four years or left longer if possum numbers have not built up. The map overleaf (Map 9) shows the aerial and ground based possum control areas within the rohe of Ngati Pahauwera.

Ferrets, Stoats and Rats are of an unknown quantity, they are killed as a by catch to the possum control programme however they do return to pre-operational levels quite quickly due to food abundance once the possum has been removed.

Our programme is not used to control pigs, they are only collected as an indicator species due to their scavenging feeding habitats and the ability to easily contract tuberculosis, however if they do catch Tb then this is viewed upon as there is a Tb foci somewhere in the area. The pig is not viewed on as a high risk vector and is generally classed as an end host for the disease. There have been pigs taken out of this area with Tb, hence the large scale programme in the district.

In summary, possum numbers will be controlled over these 120,000 hectares for many more years yet to come, these projects are part of a far greater programme extending throughout the Hawke's Bay region and with such a large programme in place re-invasion from outside is very minimal. As an overall result the disease prevention, conservation and ecological value is enormous.

Map 9 outlines aerial and ground based possum control areas of the scoping study catchments.

In terms of Total Control Plants (plants that are in our Management Strategy that must be controlled) there are only two locations in the Ngati Pahauwera rohe that work is being done. These are:

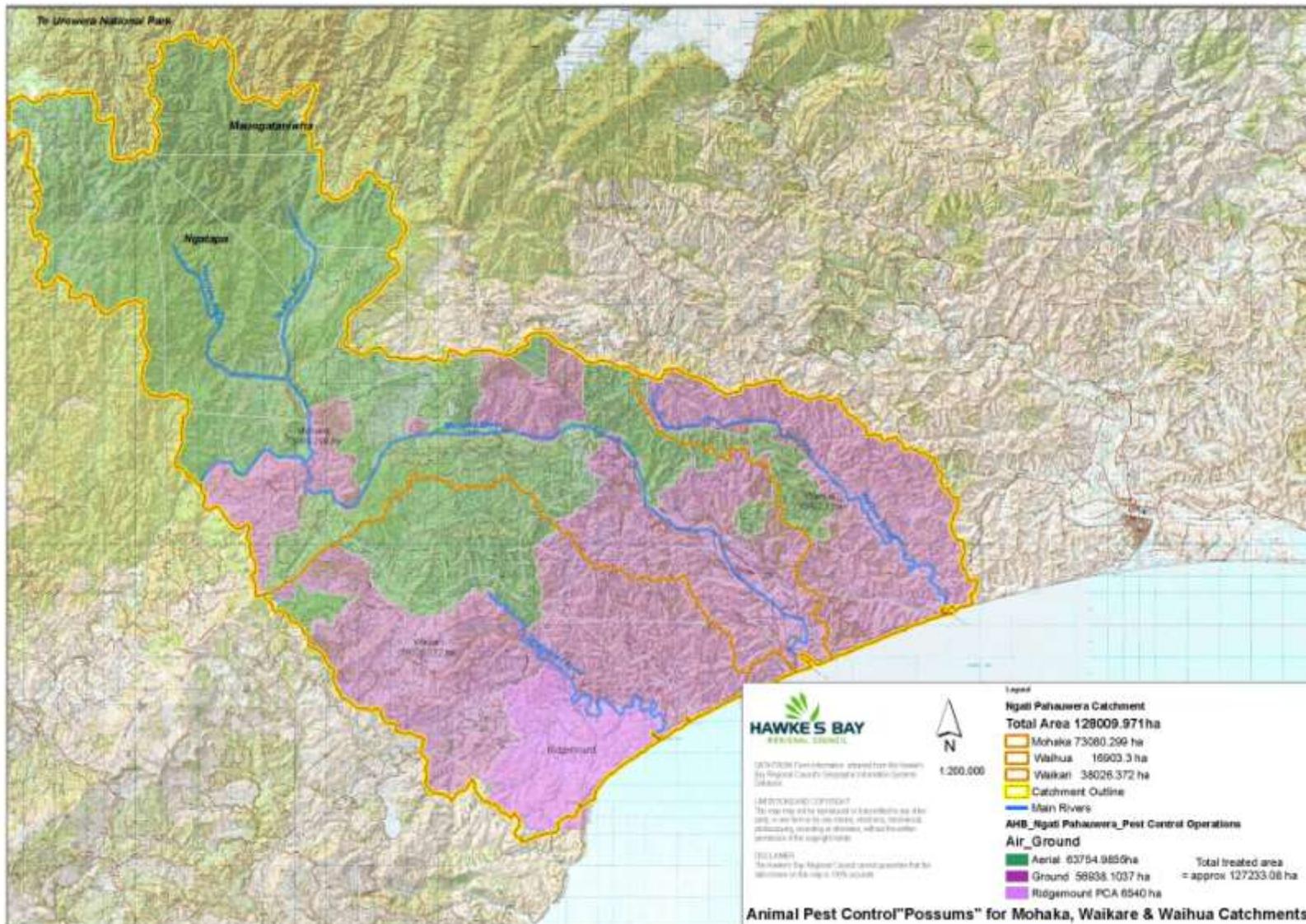
- **Old man's beard** – An infestation on the Waikari River that starts at Putorino and runs down on either side of the river downstream for approximately one kilometer. Control work has been carried out for the last five years by landowners and the HBRC.
- **Old man's beard** – An infestation on the Mohaka River that starts at the Willowflat Bridge and runs downstream spasmodically for two kilometers. Most of the infestation is on DOC land which they control via helicopter spraying.

Old man's beard, Japanese honeysuckle and *Pinus contorta* (near the headwaters of the Te Hoe and Mohaka) would be considered to be the main plant pest threats to native biodiversity.

There are a variety of other plant pests down the Mohaka, Waikari and Waihua rivers which are not being controlled, or if so are being controlled to a limited extent. These plants include blackberry, gorse, buddleia, pampas and boneseed. To control these weeds is impractical and would cost millions to achieve with very little benefit.

Large areas of these three rivers have not been monitored for plant pests, particularly in areas near the headwaters. A lot of this area has accessibility problems, with helicopters being the only practical (but expensive) option.

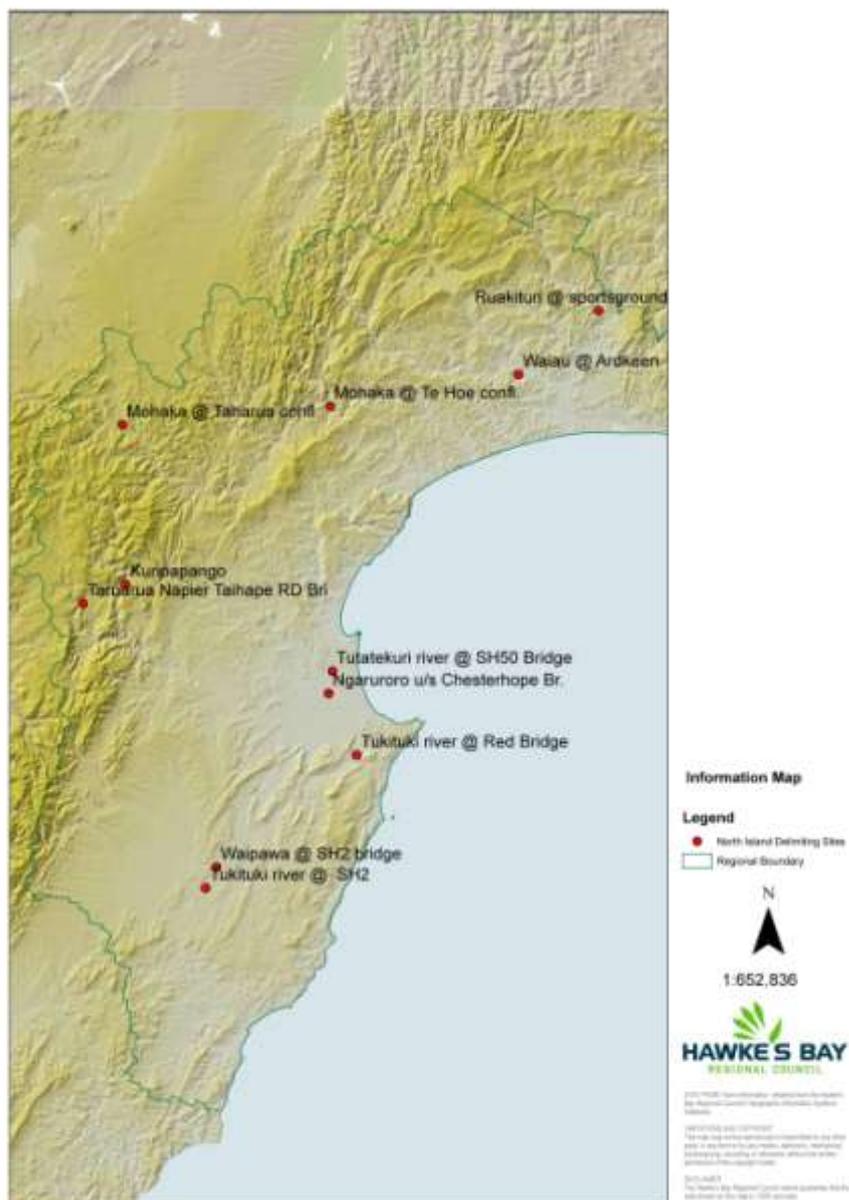
The regional council in partnership with MAF Biosecurity New Zealand, New Zealand Fish and Game Council and the Department of Conservation, have a *Didymo* surveillance monitoring programme that comprises quarterly monitoring at 13 sites throughout the Hawke's Bay Region. The sites are listed in Table 14.



Map 9: Aerial and ground based possum control areas of the catchments.

Didymo Surveillance Site Name	Responsible Monitoring Agency
Tukituki River @ SH2	HBRC
Waipawa @ SH2	HBRC
Tukituki River @ Redbridge	HBRC
Ngaruroro u/s Chesterhope Bridge	HB Fish and Game
Tutaekuri River @ SH 50 Bridge	HB Fish and Game
Taruarau River @ Napier Taihape Rd	HB Fish and Game
Ngaruroro @ Kuripapango	HB Fish and Game
Mohaka River @ Taharua Confluence	HBRC
Mohaka @ Te Hoe Confluence	HBRC
Waiau River @ Ardkeen	DOC Gisborne
Ruakituri River @ Sportsground	DOC Gisborne

**Table 14: Didymo surveillance sites throughout the Hawke's Bay Region and lead agencies responsible for sampling those sites.**



**Map 10: Routine Didymo Surveillance Sampling Sites throughout the Hawke's Bay Region**

## 5.0 BIBLIOGRAPHIC LISTING BY TOPIC

This section provides a bibliographic reference list of the topics covered in this scoping document. The literature is cited by topic for quick reference.

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## 5.7 TERRESTRIAL BIODIVERSITY VALUES

Rod Dickson, Biosecurity Advisor, Hawke's Bay Regional Council.

Parrish, G.R. (1988) Wildlife and wildlife habitat of Hawke's Bay Rivers. Science & Research Series No.2 Published by Science and Research Directorate, Department of Conservation, P.O. Box 10-420, Wellington.

Townsend A. J. (1996) Maungaharuru Ecological District. Survey Report for the Protected Natural Areas Programme. Department of Conservation Te Papa Atawhai. New Zealand Protected Natural Areas Programme No.35 ISSN 0112-9252, ISBN 0-478-01703-0. Published by the Department of Conservation.

Whaley, K.J., Clarkson, B.D., Emmett, D.K., Inners, J.G., Leathwick, J. R., Smale, M.C. & Whaley, P.T. (2001) Tiniroto, Waihua, Mahia and Matawai Ecological Districts Survey Report for the Protected Natural Areas Programme. Published by Department of Conservation. East Coast Hawke's Bay Conservancy Gisborne.

# APPENDIX 1: CONSENTED ACTIVITIES OCCURRING WITHIN THE CATCHMENTS

	A	B	C	D	E	F	G	H	I
1	MOHAKA	RIVER	CATCHMENT						
2	<b>ConsentID</b>	<b>TypeID</b>	<b>SubTypeID</b>	<b>UseDetailID</b>	<b>DecisionActual</b>	<b>ZoneID</b>	<b>ClientRptName</b>	<b>Purpose</b>	<b>PropertyAddress</b>
3	WP090641T	WATER	TAKE	WASTEWSH	4/02/10	MOHA	Feather Holdings Limited	to take water from an unnamed tributary of the Taharua River for use in a dairy shed.	664 Taharua Road, Taupo
4	WP080130T	WATER	TAKE	IRRIGATN	18/11/09	MOHA	Paroa Trust	to take water from a gallery structure (well no. 3710) adjacent to the Mohaka River via a submersible pump	Mohaka Township Road, Mohaka
5	WP080196T	WATER	UNDERTAKE	IRRIGATN	30/04/09	MOHA	Mohaka Water Company Limited	to take water from well no. 4903 (300 mm diameter) adjacent to the Mohaka River by means of an infiltration	State Highway 2, Raupunga
6	WP080027T	WATER	TAKE	WATER	29/04/09	MOHA	Mohaka Aggregates	to take water from the Mohaka River for the purpose of washing shingle as restricted by Section 14 (1) of the Resource Management Act 1991	Old Coach Road, Mohaka
7	DP080028W	DISCHARGE	WATER	WASTEWSH	29/04/09	MOHA	Mohaka Aggregates	to discharge shingle wash water into water (the Mohaka River) via a settling pond, as restricted by Section 14 (1) of the Resource Management Act 1991	Old Coach Road, Mohaka
8	DP090163L	DISCHARGE	LAND	SEWSECTR	20/04/09	RPGA	Te Huki Marae Trustees	to discharge secondary treated domestic effluent from a marae into the ground in circumstances where the effluent is not used for any purpose	36 Putere Road, Raupunga
9	WP080172T	WATER	UNDERTAKE	WATER	1/04/09	MOHR	Spring Valley Holdings Limited	to take water from well no. 4001 (100 mm diameter) to provide water for a rotary dairy shed	4670 State Highway 2, Kotemaori
10	LU080491C	LAND	STRUCTURE	STACCESS	12/12/08	N/A	Matariki Forests Limited	To undertake works within the bed of the Mangapuru Stream and to undertake other activities directly adjacent to the stream	Willowflat Road, Kotemaori
11	DP080170L	DISCHARGE	LAND	WASTEWSH	4/06/08	TUTI	Spring Valley Holdings Limited	to discharge dairy effluent from a herd of up to 800 cows from the operation of a dairy shed onto land, in circumstances where the effluent is not used for any purpose	4670 State Highway 2, Kotemaori
12	DP060418L	DISCHARGE	LAND	LEACHATE	5/10/06	N/A	Tiaki Plantations Company	to discharge and contain up to 10000 m3 of wood biomass to land in circumstances where contaminants are not expected to be released to the environment	Ngatapa Forest, Waitara Road
13	DP060419A	DISCHARGE	AIR	AIRCOMB	28/09/06	ASGR	Te Pohue School Board of Trustees	to discharge contaminants from a school incinerator to air	Richmond Road, Te Pohue
14	LU050290C	LAND	STRUCTURE	STACCESS	13/07/05	N/A	New Zealand Transport Agency	to construct a culvert consisting of one 1650 mm diameter concrete/steel pipe in the bed of an unnamed stream	State Highway 5, Te Haroto
15	WP050291D	WATER	DIVERT	STACCESS	13/07/05	MOHA	New Zealand Transport Agency	to construct a culvert consisting of one 1650 mm diameter concrete/steel pipe in the bed of an unnamed stream	State Highway 5, Te Haroto
16	DP000643L	DISCHARGE	LAND	WASTEUNT	13/07/01	WAIR	Spring Valley Holdings Limited	to discharge dairy farm effluent from a dairy herd of 300 cows onto land, in circumstances which may result in the effluent being used for any purpose	Kakariki Farm Road, Kotemaori
17	DP000071L	DISCHARGE	LAND	WASTEUNT	27/04/00	TAUP	Feather Holdings Limited	to discharge dairy farm effluent from a dairy herd of 2600 cows in circumstances which may result in the effluent being used for any purpose	664 Taharua Road, Taupo
18	DP950129L	DISCHARGE	LAND	LEACHATE	17/03/00	WAIR	Wairoa District Council	to discharge leachate into the ground and gas into the air derived from decomposition of refuse from a landfill	Putere Road, Raupunga
19	WP970111D	WATER	DIVERT	STACCESS	1/08/97	MOHA	Westervelt Sporting Lodges (NZ) Ltd	to divert a stream through two access culverts	Taharua Road, Rangataiki
20	WP950388T	WATER	TAKE	WATERAGRIC	30/11/95	MOHA	Feather Holdings Limited	to take water from a Taharua River tributary to provide a supply of water to a dairy farm	664 Taharua Road, Taupo
21	LU930288C	LAND	STRUCTURE	STACCESS	13/01/94	N/A	New Zealand Transport Agency	extending an existing culvert beneath State Highway 5 to complete the infill and reshaping of a major channel	State Highway 5, Tarawera
22									
23	WAIKARI	RIVER	CATCHMENT						
24	<b>ConsentID</b>	<b>TypeID</b>	<b>SubTypeID</b>	<b>UseDetailID</b>	<b>DecisionActual</b>	<b>ZoneID</b>	<b>ClientRptName</b>	<b>Purpose</b>	<b>PropertyAddress</b>
25	WP070501T	WATER	TAKE	IRRIGATN	30/04/09	WAI	Hedley J H & J	to take water from the Waikari River to irrigate 15 hectares of pasture	86 Waikare Road, Putorino
26	DP080338L	DISCHARGE	LAND	WASTEWSH	5/08/08	PUTO	Flathill Trust	to discharge dairy effluent from a herd of 350 cows onto land, in circumstances which may result in the effluent being used for any purpose	100 Putorino Station Road, Putorino
27	LU070686C	LAND	STRUCTURE	STACCESS	13/02/08	N/A	Wairoa District Council	to construct a gabion basket retaining wall in the bed of Waikare River and to undertake other activities adjacent to the river	Glenbrook Road, Wairoa
28	DP060410A	DISCHARGE	AIR	AIRCOMB	13/10/06	ASGR	Kotemaori School Board of Trustees	to discharge contaminants to air from a school incinerator	State Highway 2, Kotemaori
29	WP040426T	WATER	UNDERTAKE	IRRIGATN	3/02/05	WAI	Waikare Limited	to take water from well no. 5279 (350 mm diameter) in the bed of the Waikari River to irrigate 70 hectares of pasture	Waikare Road, Putorino
30	DP040041L	DISCHARGE	LAND	WASTEWSH	12/03/04	TUTI	Waikare Dairy Co Ltd	to discharge farm dairy effluent from the operation of a farm dairy onto land, in circumstances which may result in the effluent being used for any purpose	5257 State Highway 2, Putorino, H
31	DP000083L	DISCHARGE	LAND	WASTEUNT	27/04/00	TUTI	Hedley J H & J	to discharge dairy farm effluent from a dairy herd of 200 cows by spreading onto pasture in circumstances where the effluent is not used for any purpose	86 Waikare Road, Putorino
32									
33	WAIHUA	RIVER	CATCHMENT						
34	<b>ConsentID</b>	<b>TypeID</b>	<b>SubTypeID</b>	<b>UseDetailID</b>	<b>DecisionActual</b>	<b>ZoneID</b>	<b>ClientRptName</b>	<b>Purpose</b>	<b>PropertyAddress</b>
35	WP040299T	WATER	TAKE	IRRIGATN	6/10/04	WROA	Juken New Zealand Limited	to take water from the Waihua River by means of a suction pump to irrigate 8 hectares of Truffiere (hazelnut) orchard	383 Waihua Valley Road, Waihua

# DRAFT

## APPENDIX 2: POLLUTION INCIDENTS RECORDED WITHIN THE CATCHMENTS

Incident Number	Date	Easting	Northing	IncidentAc	Catchmen
ER2006.0399	18/10/2006	2818653	6236274	Abandoned Chemicals	Mohaka
ER1999.0380	6/07/1999	2814284	6208566	Agrichemical Application	Mohaka
ER2002.0256	26/07/2002	2814680	6259430	Animal Effluent	Mohaka
ER2003.0241	18/07/2003	2824042	6217836	Animal Effluent	Mohaka
ER2005.0417	31/10/2005	2794135	6248259	Animal Effluent	Mohaka
ER2005.0420	2/11/2005	2864073	6229910	Animal Effluent	Mohaka
ER2002.0098	12/03/2002	2812234	6246920	Chemical Spill	Mohaka
ER2005.0152	22/03/2005	2826356	6222898	Dead Animal	Mohaka
ER2004.0147	25/02/2004	2839287	6235981	Earthworks/Roading	Mohaka
ER2006.0184	2/05/2006	2816984	6238778	Earthworks/Roading	Mohaka
ER2006.0195	21/04/2006	2822251	6220244	Earthworks/Roading	Mohaka
ER2003.0446	9/12/2003	2819400	6232151	Forestry	Mohaka
ER2005.0041	12/01/2005	2838350	6238331	Forestry	Mohaka
ER2008.0392	4/11/2008	2814153	6219047	Forestry	Mohaka
ER2004.0010	8/01/2004	2862100	6230525	Hydrocarbon Spill	Mohaka
ER2002.0285	19/08/2002	2821834	6215545	Logging	Mohaka
ER2004.0086	13/03/2004	2822852	6216976	Meat/Fish Processing	Mohaka
ER2003.0431	14/12/2003	2840686	6233614	Natural Occurrence	Mohaka
ER2005.0049	1/02/2005	2838194	6240232	Structures Over Water	Mohaka
ER2010.0129	3/03/2010	2825324	6216484	Timber Mills/Wood Processing	Mohaka
ER2006.0096	28/02/2006	2794309	6232888	Unknown	Mohaka
ER2005.0192	31/05/2005	2819366	6235441	Vehicle Accident	Mohaka
ER2006.0315	15/08/2006	2861473	6230958	Vehicle Accident	Mohaka
ER2008.0223	20/06/2008	2861746	6230827	Vehicle Accident	Mohaka
ER2007.0052	26/01/2007	2876004	6226622	Farm Tips/Offal Pits	Waihua
ER2001.0082	15/02/2001	2864411	6236372	Rubbish/Car Dumping	Waihua
ER2004.0158	7/05/2004	2854394	6221683	Animal Effluent	Waikari
ER2005.0438	1/11/2005	2856051	6222503	Earthworks/Roading	Waikari
ER2002.0289	21/08/2002	2856280	6222628	Rubbish/Car Dumping	Waikari
ER2003.0244	23/08/2003	2856236	6222485	Rubbish/Car Dumping	Waikari

## APPENDIX 3: DETAILED SUMMARY OF NATURAL HAZARDS

This section provides a summary of what is known about the historical and potential earthquake influences on the course of any of the following rivers.

- Lower Mohaka River – From the Te Hoe River down (inclusive of the Te Hoe)
- Waikari
- Waihua Rivers

If additional earthquake research is required, an approach would have to be made directly to GNS Science, 1 Fairway Drive, Avalon, PO Box 30368, Lower Hutt 5040 to cost the commissioning of the required work.

As tsunami is often generated by undersea earthquakes, a brief summary outlining these known risks for the area are also provided.

While this section references relevant reports in relation to earthquake and tsunami, the Council also maintains an 'Online Natural Hazard Resources Database' on its website (link below) which is a register of hazard documents, research material, and publication from either the Council or external organisations and this database may contain other pertinent information related to this area.

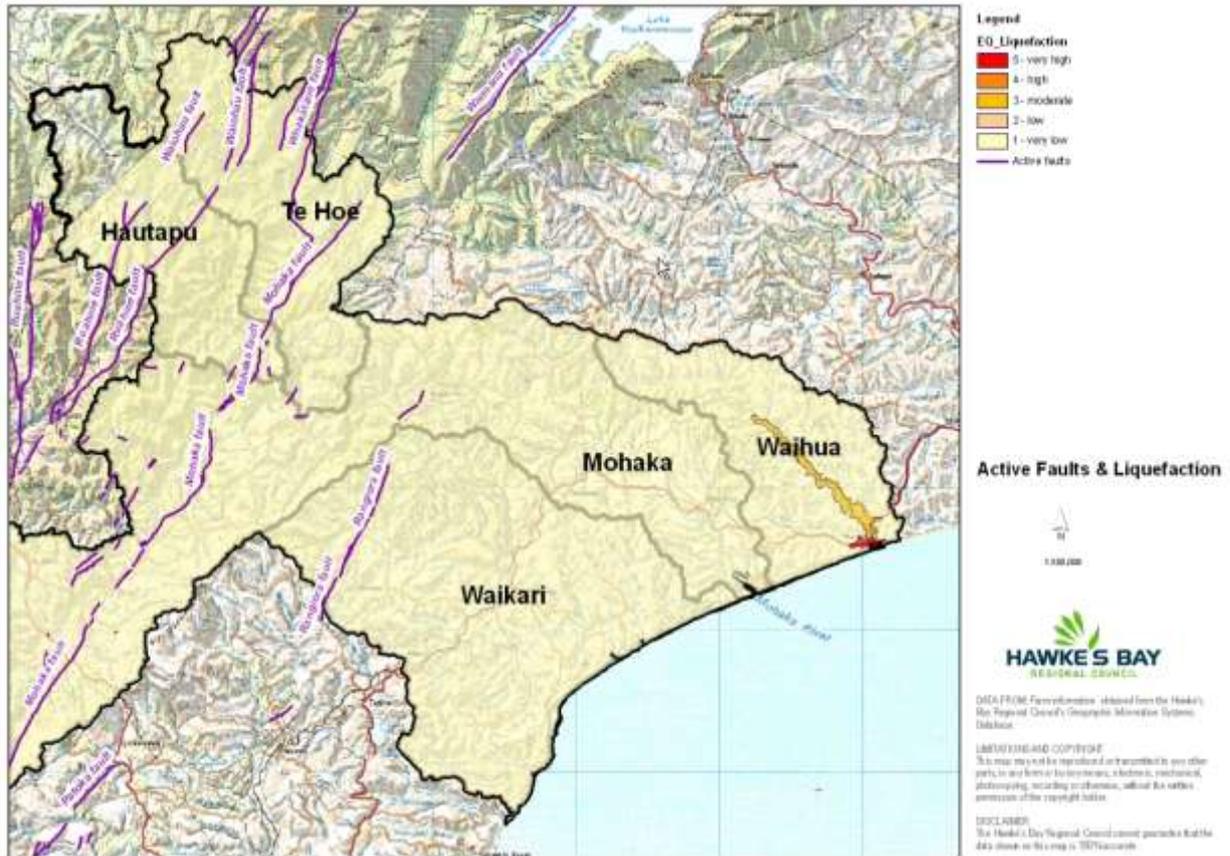
<http://www.hbrc.govt.nz/ReadAboutIt/NaturalHazardResourcesDatabase/tabid/840/Default.aspx>

### (a) **Earthquake**

No specific earthquake hazard information is held by the Hawke's Bay Regional Council for these rivers.

### Fault rupture hazard

The Hawke's Bay Regional Council 1:50,000 scale fault maps, which are small-scale geological maps, show active fault traces crossing these rivers as shown on the map (Map 7).



**Map 7: Active Faults & Liquefaction**

These mapped fault traces include:

#### Ruahine Fault

The Ruahine Fault is predominately a strike-slip fault separating the stable microcontinental platform area of New Zealand from the zone of deformation known as the East Coast Deformed Belt, immediately west of the Hikurangi trough. The Ruahine and Mohaka Faults are two of the major active faults of the Hawke's Bay Region, and are major strands of the Wellington fault system. This system can be traced continuously through the North Island from Wellington to the Bay of Plenty. Between them, the Ruahine and Mohaka faults account for 2000m of vertical uplift of the Ruahine and Ahimanawa ranges during the last c.5 million years. The Ruahine fault trends northeast, and has straight, demonstrable active traces discontinuously along its length of more than 100km.

Studies along the Ruahine fault (Beanland & Berryman 1987) indicate that several rupture events have occurred since 16-17,000 years ago. One event may have occurred during the last 1,800 years. Each event is thought to be accompanied by 2 -5 metres of right lateral, oblique-reverse slip. An average horizontal slip rate of 1-2 mm/year for the Holocene (last c10,000 years) has been inferred, and a recurrence interval of between 1,000 and 5,000 years between major earthquake events is calculated.

#### Mohaka Fault

The Mohaka Fault (Figure 1) is a major northeast trending, dextral-reverse strike-slip fault which, with the Ruahine Fault, forms one of the principal structural features of the eastern North Island. Raub et al (1987) conclude that events on the Mohaka fault involved c. M7.5 earthquakes, right lateral oblique movements of about 3.5m and have a recurrence interval of c. 1000 years. The average right lateral slip rate of the Mohaka fault is about 3mm/year. Radiocarbon dating of wood

fragments from trench across the fault in the Wakarara area indicates that the last surface rupture is less than 1,200 years old (Raub et al. 1987)



**Figure 1: Photograph from GNS Active Fault Database showing part of the Mohaka Fault**

#### Rangiora Fault

The Rangiora Fault is a 14 km long structure that trends 030 degrees and is located 13 km east of the Mohaka Fault in Hawkes Bay. A central, active section of the fault is 5 km long, and shows reversals of upthrown side. Fluvial terraces (ages constrained by blanketing tephra) on the south bank of Waikari River show a progressive increase in dextral offset with age. Three faulting events of 4-6 m are indicated, one between 3300 years and 1900 years a further two events in the last 1900 years. A roadcut exposure revealed a sequence of tephra, paleosols, and fault scarp colluvium indicating four faulting events, two between 3300 years and 1900 years, and two in the last 1900 years. Recent movement on the Rangiora Fault has occurred at a similar rate to the Mohaka Fault.

Refer GNS Science Report: Cutten, H.N.C.; Beanland, S.; Berryman, K.R. 1988 The Rangiora Fault, an active structure in Hawkes Bay.

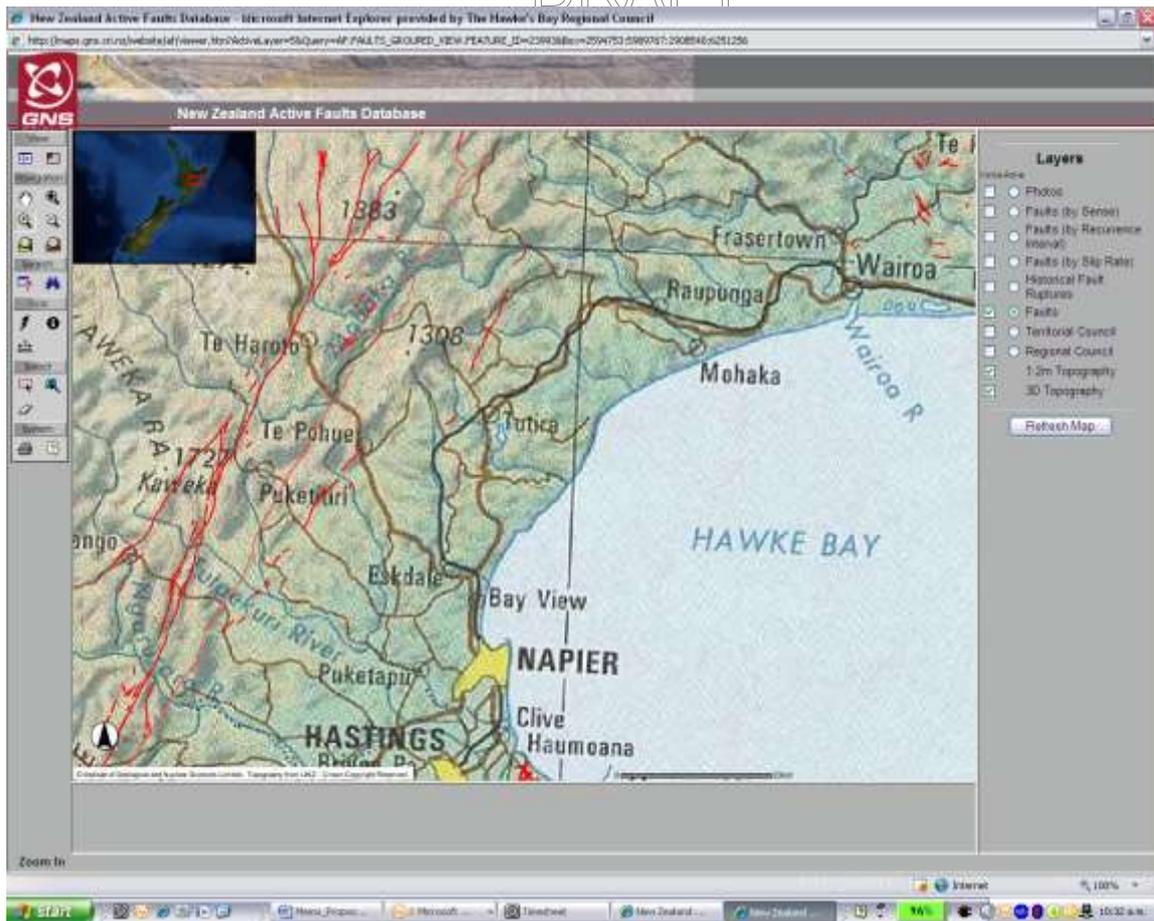
#### Waiohau Fault

The Waiohau Fault has a recurrence interval of between 2,000 and 3,500 years between major earthquake events - the Council holds little information on this fault.

#### Whakatane Fault

The Whakatane Fault has a recurrence interval of less than 2,000 years between major earthquake events with the last event in the last Millennium - the Council holds little information on this fault.

These faults are classified in the on-line GNS Science Active Faults Database as shown in Figure 2 overleaf.



**Figure 2: Extract from GNS NZ Active Faults Database**

### Ground shaking hazard

Regional-scale studies indicate that ground shaking of Modified Mercalli (MM) intensity 8.8 is expected in the Tutira area at least every 142 year return period (10% probability of exceedance in 15 years) and MM intensity 9.4 at least every 475 years (10% probability of exceedance in 50 years). These figures are derived from GNS Client Report 33591D "Hawke's Bay Region Earthquake Analysis Programme Stage 2 February 1997".

The MM intensity scale is a descriptive scale from 1 to 12 used to describe the "strength" of earthquake shaking at a particular location. At MM intensity 6 ground shaking is felt by everyone, furniture moves and plaster cracks, loose material may be dislodged from sloping ground, e.g. existing slides, shingle slides. At MM intensity 7 it is difficult to stand, furniture breaks, and plaster, loose bricks and tiles fall, small slides such as falls of sand and gravel banks, and small rock falls from steep slopes and cuttings, some fine cracks appear in sloping ground. At MM intensity 8 driving is difficult, ordinary masonry is damaged, chimneys and towers fall, and cracks appear on steep slopes and in wet ground. At MM intensity 9 there is general panic, and masonry and foundations are damaged or destroyed, landsliding general on steep slopes, cracking of ground conspicuous, liquefaction.

### Liquefaction hazard

Liquefaction susceptibility maps have been prepared for the Hawke's Bay region and were used in the Hawke's Bay Engineering Lifelines Study (see Map 6) showing liquefaction potential in Hawke's Bay. A map of the area provided (Mp 5) showing susceptibility to liquefaction indicates there is

little risk for the area in question, but saturated silty or sandy soils may be prone to liquefaction (loss of bearing strength) during strong ground shaking of MM intensity 7 or greater.

#### Further information

Further information on earthquake hazards, the earthquake magnitude scale and the Modified Mercalli intensity scale can be found in the Institute of Geological & Nuclear Sciences Reports commissioned by the Hawke's Bay Regional Council and Local Authorities in Hawke's Bay:

Begg, J.G.; Hull, A.G.; Downes, G.L. 1994 Earthquake hazards in Hawke's Bay : initial assessment. : . *IGNS client report 333901.10*.

Begg, J.G.; Hull, A.G.; Robinson, R. 1996 Earthquake hazard analysis - Stage 1. Recurrence of large earthquakes determined from geological and seismological studies in the Hawke's Bay area. *IGNS client report 33591D.10*.

Hengesh, J.V.; Heron, D.; Brown, L.; Hull, A.G. 1996 Stage II - Earthquake Analysis: Part II - Evaluation of Liquefaction Potential in the Hawke's Bay Region. : . *IGNS client report 33591.D. 37* p.

These reports can be viewed at the Hawke's Bay Regional Council or can be ordered directly from GNS Science. Further district-scale information on ground shaking, liquefaction and probabilistic peak ground acceleration can be found in "*Facing the Risks*" the report of the Hawke's Bay Engineering Lifelines Project available from the Hawke's Bay Regional Council.

#### (b) **Tsunami**

No specific tsunami hazard information is held by the Hawke's Bay Regional Council related to these rivers. Nevertheless several moderate-size tsunamis have been observed along the Hawke's Bay coasts in the 160 years or so of written historical record. The largest earthquake in Hawke's Bay history, the magnitude 7.8 Hawke's Bay earthquake on 3 February 1931, initiated a moderate tsunami. It was only reported at a few locations but notably one was a large wave reported in the Waikari River. This appears to have been caused by an earthquake triggered landslide on the other side of the estuary. The wave destroyed a wool shed and deposited fish on grass about 15 metres above high tide level.

There are numerous active faults and folds off the Hawke's Bay region that could produce earthquakes large enough to generate tsunami. The most important of these are the Lachlan Fault and the interface between the Australian and Pacific Plates beneath the east coast of the North Island. Modelling studies have shown that a large magnitude earthquake (about 7.5) centred on the Lachlan Fault could generate waves 4 metres or more high along parts of the Hawke's Bay coast (Figure 3). Such an event could result in a tsunami travelling up any of these coastal rivers

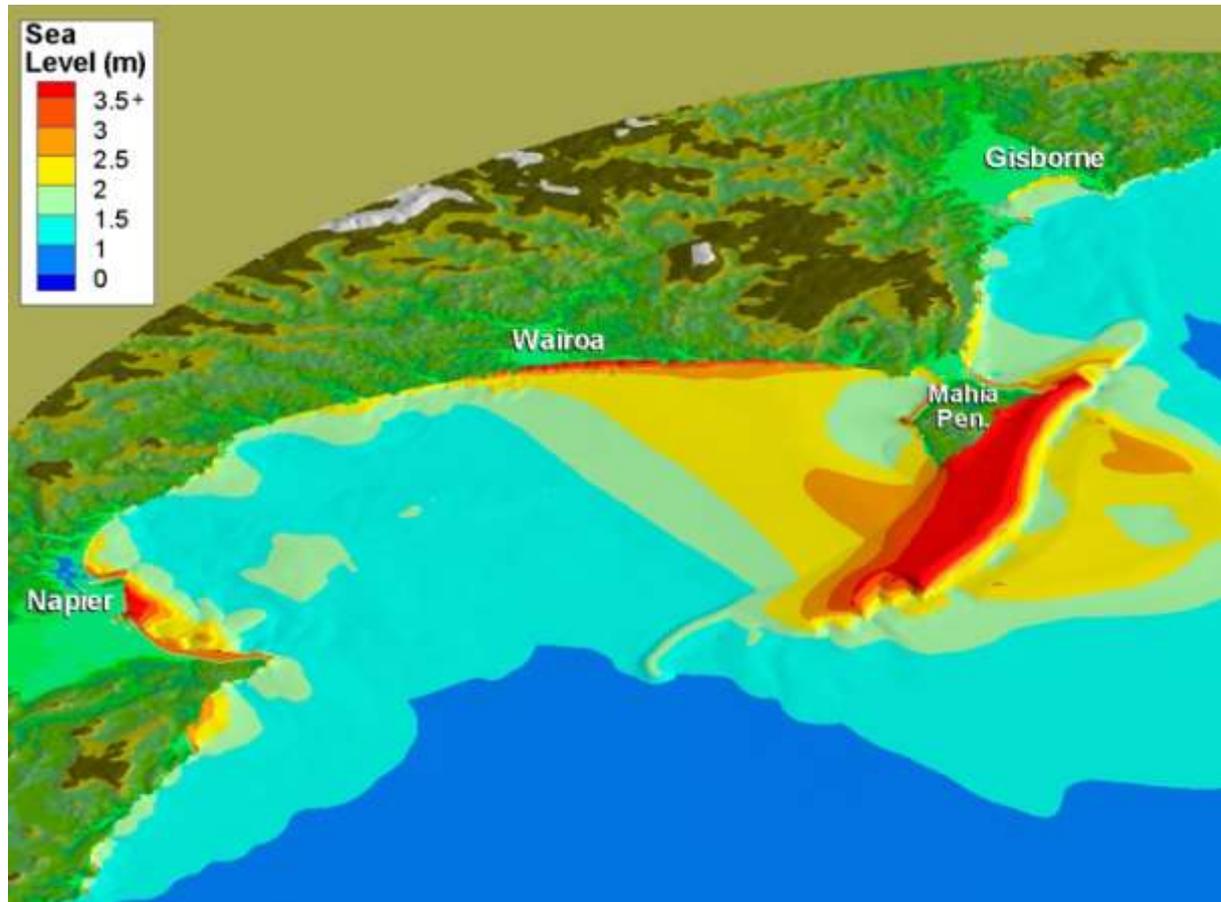
#### Further information

Further information on tsunami hazards can be found in the Institute of Geological & Nuclear Sciences Reports commissioned by the Hawke's Bay Regional Council and Local Authorities in Hawke's Bay:

Berryman, K. R. (compiler), (2005). Review of Tsunami Hazard and Risk in New Zealand. Prepared for the Ministry of Civil Defence and Emergency Management. Client Report 2005/104. Institute of Geological and Nuclear Sciences, Lower Hutt, pp 139. (Available from <http://www.civildefence.govt.nz>)

Webb, T. (compiler), (2005). Review of New Zealand's preparedness for tsunami hazard, comparison to risk and recommendations for treatment. Prepared for the Ministry of Civil Defence and Emergency Management. Client Report 2005/162. Institute of Geological and Nuclear Sciences, Lower Hutt, pp. 160. (Available from <http://www.civildefence.govt.nz>)

Van Dissen, R.J.; Lester, R.; Barnett, A.G. 1994 Tsunami hazard study for the Hawke's Bay Region. : . *Institute of Geological & Nuclear Sciences client report 33901.20.*



**Figure 3: Tsunami risk of the Hawke's Bay Coastal Environment**

#### Important notes

The earthquake and tsunami hazard assessment methodologies, information compilation and presentation techniques used for this assessment include certain qualifications and limitations on the use of the earthquake and tsunami hazard information.

1. Ground shaking is one effect of earthquakes and is generally greatest near the fault (earthquake source) that has generated the earthquake. Earthquakes can also cause ground damage through:
  - permanent displacement (rupture) of the ground surface along the fault
  - general deformation of the ground surface near the fault
  - local and regional scale uplift, subsidence and tilting
  - settlement of the ground surface through densification of dry sand
  - liquefaction (where saturated soil behaves like a liquid during very intense ground shaking), which can cause ground settlement, ejection of sand and water, lateral spreading (sideways movement of soil) near rivers and other water bodies, and flow

failures (similar to a landslide but can occur on slopes with angles as low as 2 degrees).

2. The earthquake and tsunami hazard information provided is regional in scope and cannot be substituted for site-specific investigations. A suitably qualified and experienced practitioner should assess any site-specific potential for earthquake or tsunami damage if necessary.
3. The hazard information provided is based on the best information available at the time of the studies and was supplied to Hawke's Bay Regional Council under specific contract arrangements including financial and time constraints.
4. Hawke's Bay Regional Council and other organisations may hold more detailed earthquake or tsunami information than provided here. Any additional information held by Hawke's Bay Regional Council is available on request.
5. The earthquake and tsunami hazard information may be liable to change or review if new information is made available.
6. Wairoa or Hastings District Council may hold site-specific flooding, soils/foundation condition information for this area or nearby areas.
7. The earthquake or tsunami hazard information provided does not imply any actual level of damage to any particular structure, utility service or other infrastructure.

## APPENDIX 4: KNOWN FISH BARRIERS OCCURRING WITHIN THE MOHAKA RIVER CATCHMENT

BARRIER_ID	LOCATION_ID	DATE_	OBSERVER	EASTING	NORTHING	STREAM_NAM	MAIN CATCH	CATCHMENT	BARRIER_TY	U/S NET LENGTH (m)	US BAR CNT	CATCH_ HA	INDFOR_ HA	% forest_ ca	Rank
52	49	21/07/2009	HBRC	2848491	6235542	Mohaka Trib	218.000	218.000	culvert	1280	0	0.00	0	0.0	15
53	50	21/07/2009	HBRC	2847701	6235722	Mohaka Trib	218.000	218.000	dam	939	0	68.10	14	20.6	32
54	51	21/07/2009	HBRC	2847405	6235648	Mohaka Trib	218.000	218.000	culvert	345	0	0.00	0	0.0	15
57	53	5/06/2002	DOC	2820600	6213300	Inangatahi Stream Trib	218.000	218.260	weir	15451	0	0.00	0	0.0	25
61	57	5/06/2002	DOC	2812400	6214100	Pakatutu Rd Creek	218.000	218.000	culvert	3419	0	336.40	9	2.7	20
62	58	5/06/2002	DOC	2813481	6215466	Pakatutu Stream	218.000	218.000	culvert	1991	0	0.00	0	0.0	27
63	59	5/06/2002	DOC	2812900	6211530	Pakatutu Stream	218.000	218.000	culvert	4043	1	0.00	0	0.0	24

# APPENDIX 5: CONCESSIONARY CONDITIONS ISSUED BY THE DEPARTMENT OF CONSERVATION.

## SPECIAL CONDITIONS – New Zealand Professional Fishing Guides Association (NZPFGA)- CA-14979-GUI

- (1) This Concession authorises 150 professional fishing guides to carry out the Concession Activity on the Land. The Concessionaire shall provide to the Grantor an updated list of these guides prior to any rights being exercised under this Concession.
- (2) This Concession also authorises up to a maximum of a further 30 guides to carry out the Concession Activity on the Land, provided that the Concessionaire notifies the Grantor of the details of each such additional guide who wishes to operate under the authority of this Concession.
- (3) Upon the granting of this Concession, the Concessionaire shall provide a copy of this Document to every guide who wishes to operate under the authority of this Concession. The Concessionaire shall obtain and provide to the Grantor a written acknowledgment from every such guide in the form as set out in Schedule 6. No guide may operate under the authority of this Concession until the written acknowledgment from that guide is completed and provided to the Grantor.
- (4) This Concession authorises the Concessionaire to carry out the Concession Activity only, but does not authorise the Concessionaire to do anything which would not otherwise be permitted or which would require some other form of authority from the Grantor or any other person. Without limiting the effect of this clause and by way of example the Concessionaire is not authorised under this Concession to:
  - (a) Access any part of the Land by air unless such access is with an air operator who is otherwise authorised to fly into the area concerned;
  - (b) Breach any law, regulation, by-law, restriction, requirement, notice, sign, or provision of any Conservation Management Strategy or management plan.
  - (c) Access any Land or water other than those areas listed in Schedule 1
  - (d) Access any Private Land.
- (5) The Concessionaire will take all reasonable steps to ensure that any guide operating under the authority of this Concession complies with all the conditions of this Concession. Where the Concessionaire becomes aware of any breach or non-compliance by any guide, then the Concessionaire shall inform the Grantor immediately and the Concessionaire shall take action (including enforcement action and where appropriate expulsion of the guide from the Association) to deal with such breach or non-compliance.
- (6) For the sake of clarity, the Grantor may exercise any rights of temporary suspension or termination of this Concession in part or in its entirety contained in clauses 17 and 19 respectively of this Document where there is a breach or non-

compliance with this Concession by any guide. The Grantor may also take action against an individual guide where there is non-compliance with the conditions of this Concession.

- (7) In the event that there is any breach or non-compliance by any guide with any of the conditions contained in this Document, then the Grantor may notify the Concessionaire that the guide in question is no longer authorised to operate under the authority of this Concession.
- (8) The Grantor may vary the conditions of this Concession, on request or on his or her own motion where the variation is necessary to deal with significant adverse effects of the activity that were not reasonably foreseeable at the time the concession was granted.
- (9) This Concession authorises a guided party size of no greater than three (3) persons (including guides) on any trip, except where fishing from a boat, for fishing instruction schools and for family groups.
- (10) The Concessionaire shall adhere to the Environmental and Water Care Codes attached as Schedule 4 to this Document.
- (11) While conducting the Concession Activity the Concessionaire shall ensure that all guides and clients hold all applicable licences, (including NZ Fish and Game Licences) and all other permissions that are required to be held.
- (12) The Concessionaire shall ensure that in no case will any guides and clients, in conjunction with any other Concessionaires and clients, occupy more than half of the available bunk space in any hut, unless that bunk space would otherwise remain unoccupied. Where any guide is undertaking an overnight trip, then tents must be carried so that the guide and any clients are equipped for camping.
- (13) While conducting the Concession Activity the Concessionaire shall ensure that all guides and clients have current hut passes or hut tickets for huts they intend to use.
- (14) The Concessionaire shall ensure that guides and clients do not occupy any hut or designated campsite for more than two consecutive nights, unless the hut would otherwise be empty or it would be unsafe for concessionaire parties to move.
- (15) The Concessionaire shall not leave, store or otherwise cache any equipment on the Land or in any hut without the specific authority of the Department's Area Manager with the administrative responsibility for the specific area in question.
- (16) The Grantor shall be entitled to send any officer of the Grantor on any part of the Concession Activity undertaken on the Land for the purpose of assessing the impact on conservation and other values, and the implications of the service offered to the Concessionaire's clients in terms of the Department's overall responsibilities to visitors.
- (17) The Concessionaire shall, each year on the anniversary of the start of the Concession term provide the Grantor with a return in the form attached as Schedule 5 showing the information set out in that return. A nil return shall be submitted where any guide has not exercised any right under this Concession.

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- (18) The Concessionaire shall not, during the nesting season for riverbed dwelling birds, use any river bed that is administered by the Department for vehicle access otherwise than on a formed vehicle track.
  - (19) The Concessionaire shall not access any site on the Land with any vehicle except on formed roads and vehicle tracks except that this Concession does not authorise any such access to any areas which would not otherwise be permitted.
  - (20) The Concessionaire shall ensure that a fire extinguisher, in good working order, is carried on vehicles and boats at all times when exercising rights under this Concession.
  - (21) The Concessionaire shall ensure that any boats used as part of the Concession Activity are thoroughly cleaned prior to entering the Land or water within the Land to ensure that aquatic weeds, hydrocarbon fuels or lubricants or other contaminants are not introduced into any water or deposited on the Land.
  - (22) The Water Speed Regulations 1979 shall be observed at all times when using boats
  - (23) The Concessionaire must exercise reasonable consideration towards other users of lakes and rivers and must remove any boat and trailer when not in use. The boat ramps are public facilities and the applicant has no special rights over other operators or members of the public.
  - (24) The Concessionaire shall ensure all refuelling of powered boats takes place off the Land or in such a manner as to prevent spillage of fuel onto the Land or any water.
  - (25) The Concessionaire shall ensure that footwear and waders worn on the Land or any water within the Land are cleaned prior to entering the Land to avoid the transportation of weeds and plant seeds.
  - (26) The Concessionaire shall ensure that it and any clients remain on formed tracks or recognised routes where these facilities exist, to protect natural and historic features of the Land.
  - (27) The Concessionaire shall comply with any loading restrictions placed on structures.
  - (28) The Concessionaire shall use toilets where these are provided on or close to the Land. Where there are no toilet facilities, the Concessionaire shall ensure that any toilet waste and paper is buried in a shallow hole at least 50 metres from any water source or track.
  - (29) The Concessionaire shall ensure guides record any sightings of indigenous fish and shall forward these records to the closest Department of Conservation Area Office.
  - (30) The Concessionaire acknowledges that this Concession does not give the Concessionaire any preferential rights to use the Land for the Concession Activity and the Concessionaire will ensure that every reasonable effort is made by guides to minimise the impact of the Concession Activity on other users of the Land.
  - (31) The Concessionaire shall ensure that it does not monopolise fishing areas in a way that excludes the general public from enjoying that particular area.
  - (32) The Concessionaire will render all reasonable assistance if called upon during a Search and Rescue Operation.

- (33) The Concessionaire is required to consult with and seek the guidance of iwi who claim manawhenua over any parts of the land (including waterbodies) to ascertain which sites have historical, cultural or spiritual significance to them so as to avoid or mitigate any adverse impacts their activities may have on those values, and to ensure that any interpretation on matters of iwi historical, cultural or spiritual significance is accurate.
- (34) The Concessionaire shall ensure that any interpretation provided to its clients on Ngai Tahu historical, spiritual or cultural association with any area or indigenous species is entirely consistent with the statutory acknowledgements and Topuni statements contained in schedules 14 -108 of the Ngai Tahu Claims Settlement Act 1998 or any Department produced interpretative material. The Concessionaire shall notify the relevant Papatipu Runanga if they are using the above information, as a matter of courtesy. Where the Concessionaire wishes to provide clients with information not covered in these sources but that still relates to Ngai Tahu historical, spiritual or cultural association with any area or indigenous species then the Concessionaire shall consult with the local Papatipu Runanga before using any information.
- (35) The Concessionaire shall not remove pounamu from the land.
- (36) Motorised vehicular access is not permitted by the Concessionaire in any Wilderness Area.
- (37) The Concessionaire shall ensure that guides operating by virtue of this concession carry identification identifying themselves as members of New Zealand Professional Fishing Guides Association and that they have agreed to be bound by this concession (that is – that they have signed the Acknowledgement attached as Schedule 6). It is the Concessionaires responsibility to develop such a form of identification.
- (38) The Concessionaire shall not amend its constitution in a manner which would derogate from the ability of the Concessionaire comply with the conditions of this permit.
- (39) The Concessionaire shall take reasonable steps to assist the client's understanding of the features, values and conservation issues of natural and historic resources of the Site and the surrounding area.
- (40) The Concessionaire shall, if required by the Grantor, prepare an interpretation plan that demonstrates how they will assist their clients understand the features, values and conservation issues of natural and historic resources of the Site and the surrounding area. This plan must then be approved by the Grantor. Once approved the Concessionaire and their staff shall be responsible for following the approved implementation plan.

#### *CONSERVANCY SPECIFIC CONDITIONS*

- **East Coast/ Hawkes Bay**

- (43) The use of motorised craft is prohibited on Lake Tutira, Lake Opouahi, Lake Kuripapango and Lake Waikapiro.

Special Conditions – Rapid Sensations- ~~TT-15232-GUI~~ DRAFT

1. The Land and the Concession Activity are further defined as follows:

Raft and Kayak	<p><b>Mohaka River:</b> Mangatainoka Hot Springs, 20 Minute Flat (Grid Ref U20 076 196) including Glenfalls Reserve, Bridget's Clearing, Mohaka Conservation Area.</p> <p><b>Motu River:</b> Down the Motu River to Whites Rapid (Opotiki Area Office) From the Motu Falls to the road bridge (North of Te Karaka - Gisborne Area Office)</p> <p><b>Ngaruroro River:</b> Ngaawapurua Hut, Omar Bivvie, Rocks Ahead, Kiwi Mouth and Cameron Huts.</p> <p><b>Rangitikei River:</b> Mangamaire Campsite, Waingakia Campsite.</p> <p><b>Tongariro River:</b> Overnight camp at bottom of Confusion Rapid (Grid Ref TI9 554 304).</p>
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1. The Concessionaire shall report to the Grantor all injury accidents occurring on the Conservation Area relating to the activity. If the Grantor decides after an inquiry and consultation with the Concessionaire that the standard of safety was not maintained as outlined in the Concessionaire's "Safe Operations Plan", this permit may be terminated.
2. The Concessionaire will render all reasonable assistance if called upon during a Search and Rescue Operation.
3. This permit does not give permission for access to private land or reserves vested in other agencies.
4. The Concessionaire will submit to the Grantor completed records of activity on the Guiding Concession return Forms detailing activities for each quarter within 14 days of the following dates - 30 September, 31 December, 31 March, 30 June. A record of activity form should still be submitted quarterly showing nil activity if no activity is undertaken.
5. The Concessionaire will avoid overcrowding of facilities, catchments and areas by redirecting their clients if necessary and will comply with all reasonable directions given by Department of Conservation staff.
6. No vehicles are to be taken off the formed roads. This includes mountain bikes within Tongariro National Park.
7. The mountain bikes must be checked for debris in the tread of the tyres prior to undertaking any trips.
8. The Concessionaire will ensure that his clients remain on formed tracks (or boardwalks) where possible.
9. No open fires are allowed in Tongariro National Park. In all other areas, clause 13.0 -13.9 applies.
10. The Applicant will ensure that a fire extinguisher in good working order is carried on vehicles at all times.
11. No dogs or other domestic pets are to be taken into the Land unless specifically authorised by way of a permit issued by the Grantor.
12. The Concessionaire will, if requested by the Grantor, contribute to the maintenance of the Tukino Mountain Road. Such contribution shall be in fair proportion to the actual use by the Concessionaire of this road.
13. Rock climbing and abseiling are permitted subject to the Concessionaire not leaving any permanent bolts in the rock.

14. The Concessionaire is to ensure that all clients where required hold the appropriate passes, licenses and permits, as follows:

**HUNTERS** - Department of Conservation Hunting Permits

**ANGLERS** - Valid Fishing Licenses

**HUT USERS** - Valid Backcountry Hut Tickets or Great Walk Passes (this does not give rights for reservation of hut space)

**DOG OWNERS** -.Permits for dogs

15. The Concessionaire acknowledges that on Mount Titiraupenga, the summit rock is on Maori Land and therefore is not permitted to leave the track and climb the summit rock.

16. The Concessionaire shall ensure that all personnel employed by the Concessionaire for the activity will be suitably qualified and experienced. For this purpose and when requested by the Grantor the Concessionaire shall provide details of the relevant employees qualification and experience.

17. The Grantor reserves the right to request further or different activity related information in order to best monitor and determine any effects of the Concession Activity on the Land.

18. The Grantor reserves the right to apply restrictions to the Concession Activity, including but not limited to restricting the frequency of trips or reducing the maximum party size, or withdrawing all or part of the areas or activities approved. The Concessionaire shall not be entitled to any compensation in the event of such action being taken.

19. The Concessionaire will comply with the Environmental Care Code and the Water Care Code while on the land. The Concessionaire where practicable is to encourage clients to remove human waste out of pristine (high alpine) areas and dispose of it in an environmentally and culturally acceptable manner.

20. Permanent camps, food or equipment camps are prohibited and the Concessionaire must seek the written approval of the Grantor prior to establishing temporary camps, food or equipment dumps.

21. The Concessionaire shall note that the granting of this Concession shall neither give nor imply that the Concessionaire has any guarantee of any access or facilities being preferentially allocated to the Concessionaire.

22. The Concessionaire shall ensure that any use of helicopters on the land shall be by an operator who holds a Department of Conservation concession for aircraft landings.

23. The concessionaire shall maintain communications with the Ruatahuna/Manawaru Tribal Executive when flying clients into the Waiau River area (Te Urewera National Park).

24. The Concessionaire shall ensure all their/clients rubbish is transported from the Land and disposed of in an environmentally manner.

25. No open fires are allowed to be lit within the East Coast Hawke's Bay Conservancy, without first obtaining a fire permit from the Grantor (gas cookers are allowed for cooking purposes).

26. The Grantor shall be required to grant prior approval for overnight camping on the land in the Hawke's Bay area by the Concessionaire, all employees and clients. Site location with conditions of usage will be set appropriate to each site. Contact; Puketitiri Field Centre: Phone (06) 839 8814.

27. Use of tents by the Concessionaire on the Lake Waikaremoana Great Walk is restricted to the Great Walk campsites provided and is also part of the Great Walk booking system.

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28. The Concessionaire is to ensure that no trees, plants or shrubs are to be cut down, removed or in any way damaged and all reasonable precautions are to be taken to protect birdlife, flora and other natural values.
29. The Concessionaire is not to construct or erect any building or structure or navigational aid and is not to mark, cut or construct any track on the land.
30. The Concessionaire must ensure that its clients are aware of Te Urewera National Park Boundaries and do not venture onto private Maori land without the Landowner's consent.
31. The Concessionaire must ensure its employees and clients abide by all the Te Urewera National Park Bylaws and specifically be familiar with those relating to the Great Walk (copy attached).
32. The Concessionaire's party size for overnight use of Great Walk huts is restricted to fifteen people (including guides).
33. The Concessionaire and their clients will not be permitted to book Great Walk facilities between 20 December and 31 January annually.
34. The Concessionaire shall ensure that the safety standards set by the Maritime Safety Authority are strictly adhered to.
35. The Concessionaire shall ensure all persons involved in the activity wear life jackets when rafting.
36. The Concessionaire shall ensure that all employees and clients are made aware of the information on "Whitewater Duck: Whio (Blue Duck)" as provided by the Grantor in the attached handout.
37. The Concessionaire shall ensure when carrying out any activity in the Ngaruroro River area that all employees/clients are made aware that they do not enter/access land belonging to the following Iwi Trust Boards, without first obtaining written permission;
  - Owhaoko C7 Trust (West of the Ngaruroro River from Kiwi Mouth south to Cameron Camp)
    - Contact Person: Marei Apatu
    - E-mail: mareiapatu@ttoh.iwi.nz
    - Work Phone: (06) 873 0978
    - Cellphone: 025 304 282
  - Owhaoko B & D Trust (refer to the attached map for land boundary details)
    - Contact Person: Soraya Peke
    - E-mail: swpeke@xtra.co.nz
    - Work Phone: (06) 342 6838
    - Cellphone: 027 270 7763

**1. The Land is further defined as follows:**

Conservation area	Legal status	Conservation Unit Number	Grid Reference	Grid Reference
<b>EAST COAST HAWKE'S BAY CONSERVANCY</b> (note: numbers in brackets correspond to sites on attached maps)				
<b>Hawke's Bay Area Office</b>				
Kaweka Forest Park (1)	Forest Park	80021	E2800386	N6199311
Kaweka Forest Park (2)	Forest Park	80021	E2794395	N6194594
Kaweka Forest Park (3)	Forest Park	80021	E2793383	N6193015
Kaweka Forest Park (4)	Forest Park	80021	E2791864	N6192877
Kaweka Forest Park (top flats of Comet Road) (5)	Forest Park	80021	E2792800	N6188200
Kaweka Forest Park (off Kaweka Rd) (6)	Forest Park	80021	E2807384	N6208997
Mohaka Conservation Area (7)	Conservation Area	80017	V19 299266 E2828946	N6226616

**2. The Concessionaire must;**

- a) Submit to the Department of Conservation's Gisborne office annual beehive returns detailing the numbers of beehives that have been situated on each site for the previous twelve month period. Failure to do so shall entitle the Grantor to terminate this Concession in accordance with Clause 19
- b) Be aware that all archaeological sites are protected under the Historic Places Act 1993 and it is unlawful for any person to destroy, damage or modify an archaeological site without prior authorisation of the New Zealand Historic Places Trust (refer to attached brochures).
- c) Obtain written authority (in advance) from the Grantor to place new beehives upon the Land.
- d) Indemnify the Grantor, against all and any action, claim, injury, damage or loss which may arise as a result of the granting of this permit.
- e) Not light, or permit to be lit, any open air fire, without first obtaining the necessary permit from the Grantor.

**3. This concession does not;**

- a) Authorise the Concessionaire to carry out the concession activity on private land adjacent to the Land.
- b) Give nor imply preferential allocation of any access or facilities to the concessionaire.
- c) Authorise the Concessionaire to clear new beehive sites (where they are not already naturally cleared prior to the commencement of this activity).
- d) Authorise the Concessionaire to construct new roads for the purpose of siting/accessing beehives. If the Concessionaire wishes to upgrade any existing roads, the Concessionaire must obtain the prior consent of the Grantor. All such upgrades are to be paid in full by the Concessionaire.

**4. The Concessionaire must acknowledge;**

- a) That it undertakes the Concession Activity at its own risk and that the Department accepts no responsibility for damage or loss whatsoever, including vandalism to the beehives.
- b) That if the Grantor receive a complaint concerning the Concessionaire's activities on the Land, (whether made by a member of the public or by staff of the Department of Conservation), and the Grantor considers the complaint is justified, the Concessionaire shall relocate offending hives within two (2) weeks of receiving written notification of the problem.
- c) That the Grantor may, at its sole discretion, suspend this Concession in accordance with Clause 17 or may terminate this Concession in accordance with Clause 19, for reason of safety or management of the Land.

**5. The Concessionaire must note;**

- a) All costs attributable to the subsequent management of this concession which the Grantor incurs will be paid by the applicant on a cost recovery basis.

**6. The Concessionaire must ensure;**

- a) That all beehives are kept at least 100 metres away from any building, bridge, structure, dam or facility used by the public or staff of the Department of Conservation.
- b) That all beehives shall not be placed on walking tracks or within 50 metres of such tracks.
- c) That beehives are not positioned near recreational facilities or other areas used by the public (e.g. public carparks, near walking tracks, public toilets, tramping huts or adjoining public roads where the public are likely to stop [i.e. lookout points]).
- d) That no roads or tracks are blocked by beehives.

- e) That stocking densities of any apiary site (listed on Schedule 3, # 1 above) does not exceed more than thirty (30) hives.
- f) That the distance between apiary sites (within any conservation area, or sites occupied by other concessionaires) is to be no closer than 1.6 km.
- g) That existing access routes are only to be used when entering the areas of Land (listed on Schedule 3, # 1 above).
- h) That fire extinguishers are carried in all vehicles used to service the hives (reducing the possibility of forest fires).
- i) That no trees, plants or shrubs are to be cut down, removed or in any way damaged and all reasonable precautions are to be taken to protect bird life, flora and other natural values.
- j) That all employees adhere to the Environmental Care Code and the Water Care Code at all times (refer to Schedules 4 and 5 attached).
- k) That no chainsaws are taken onto the Land.
- l) Prior to entering any conservation area all hives, boots and other walking equipment are cleaned to prevent the spread of weeds.
- m) To remove all rubbish deposited on the Land by its personnel
- n) To observe the following conditions relative to specific areas listed below;

## **EAST COAST HAWKE'S BAY CONSERVANCY**

### **Hawke's Bay Area Office**

- i. Any beehives situated at the site E2793383 NZ N6 193015 within the Kaweka Forest Park must be situated on the waypoint and not in the layby next to the road.
- ii. At the Mohaka Conservation Area/Jock Sutton Road site, the beehives must be located at least 100 metres from the end of Jock Sutton Road, being a direct line commencing at the end of Jock Sutton Road and ending at the Te Hoe and Mohaka Rivers confluence.

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## SPECIAL CONDITIONS- Marlene Skeet T/A One Cast Adventures – WE-27667-GUI

### Concession Activity – maximum numbers of people

- A. Activities and locations approved are as follows subject to stated maximum party size, maximum number of clients per guide and frequencies

### Wellington Hawke's Bay Conservancy

Location	Maximum Number of clients per guide	Max no. of trips pa	Activity
All available conservation land marginal strips within the Hawke's Bay Area	6	12	Fishing
Kaweka Forest Park (CU 80021)	6	30	Short walks and fishing
Ruahine Forest Park (CU 80024)	6	4	Short walks and fishing
Ball's Clearing Scenic Reserve (CU 80071)	6	20	Short walks
Glenfalls Recreation Reserve (CU 80034)	6	6	Fishing
Lake Tutira Recreation Reserve and Wildlife Refuge (CU 80072 & 86001)	6	6	Short walks and fishing
Mohaka Conservation Area (CU 80017) includes Everetts Clearing	6	30	Short walks and fishing

### Private land

- B. This Concession does not confer any right of access over any private land or public conservation land leased by the Grantor. Any arrangements necessary for access over private land or leased land are the responsibility of the Concessionaire. In granting this Concession the Grantor does not warrant that such access can be obtained.

### DOC staff

- C. The Grantor may send any officer of the Department of Conservation on any of the activities authorised during the term of this Concession for the purpose of assessing both the impact thereof on conservation values, the standard of service offered and compliance with the terms and conditions of the Concessions, at no expense to the Grantor.

### Use of tracks

- D. The Concessionaire shall ensure that, where provided, clients remain on formed tracks or well-used routes designed to protect natural and historic features of the Land, do not enter caves and do not exceed any loading limitations placed on facilities and structures.

**Waahi Tapu**

- E. The Concessionaire shall recognise the sensitivity of waahi tapu and urupa and seek guidance of iwi who claim manawhenua over any parts of the Land prior to providing interpretation on matters of iwi cultural significance.

**Vehicle use**

- F. The Concessionaire shall not access any site on the Land with any vehicle except on formed roads and car parks except that this Concession does not authorise any such access to any areas which would not otherwise be permitted.

**Search and rescue**

- G. The Concessionaire will render all reasonable assistance if called upon during a Search and Rescue Operation.

**Weeds**

- H. The Concessionaire shall take all precautions to ensure weeds are not introduced to the Land; this includes ensuring that all tyres, footwear, gaiters and packs used by the Concessionaire, its staff and clients are clean before entering the Land.

**Interpretation materials**

- I. The Concessionaire shall consult with and seek the guidance of iwi claiming manawhenua over any parts of the Land prior to providing interpretation on matters of cultural significance to such iwi.
- J. The Concessionaire shall provide detailed information of any historical, cultural or natural science interpretation provided by the Concessionaire to its clients in the course of the Concession Activity, to the Grantor within thirty days of the date of any such written request by the Grantor.
- K. If the Grantor considers the interpretative material provided by the Concessionaire above unsatisfactory, the Concessionaire shall prepare an interpretation plan for approval by the Grantor within 60 days of advice from the Grantor that this is required.

**Didymo**

- L. The Concessionaire shall comply and ensure its clients comply with all guidelines and notices issued by Biosecurity New Zealand to prevent and avoid the spread of the pest organism *Didymosphenia geminata* as specified by the website of Biosecurity New Zealand: (refer Schedule 5) <http://www.biosecurity.govt.nz/didymo>.

The Concessionaire will update itself on this website on a regular basis

**Environment Care Code**

- M. The Concessionaire is to ensure all employees and clients adhere to the Environment Care Code and the Water Care Code at all times (refer Schedule 4)

**Activity return forms**

- N. The Concessionaire shall complete the Client Activity Return forms attached as Schedule 6, and return them quarterly to the Grantor no later than 14 days of the following dates: 31 December, 31 March, 30 June, 30 September of each year. The Grantor reserves the right to request further or different activity related information in order to best monitor and determine any effects of the Concession Activity on the Land.

**GENERAL**

1. Activities and locations approved are as follows subject to stated maximum party size, frequency and duration:

1b. East Coast Hawke’s Bay Conservancy

Name of Conservation Area	Legal Status e.g. National Park	DOC Facilities (e.g. Huts) or campsites	Max. Party size (incl. guides)	Frequency of Use (trips) per year	Duration of visit (half or full day)	Persons x Frequency x Days = Total	Activity
Anaura	Scenic Reserve	Walking track and camping	12 pax	2 trips	1 day, 1 night	24 person days	Day walk / Camping
Te Urewera	National Park	Lake Waikareiti walk	24 pax	2 trips	½ day	24 person days	Day walk
Te Urewera	National Park	Onepoto Caves walk	24 pax	2 trips	½ day	24 person days	Day walk
Te Urewera	National Park	Lake Waikaremoana on and around	24 pax	2 trips	4 days, 4 nights	192 person days	Tramping
Whinray	Scenic Reserve	Access to Motu river	15 pax	4 trips	½ day	30 person days	Rafting
Raukumara	Forest Park	Motu river	15 pax	4 trips	3 days, 3 nights	180 person days	Rafting

1d. The Concessionaire shall ensure that the Department’s appropriate Area Office is advised of each overnight trip intention at least 1 day prior to the leave date. The name(s) of the guide(s) and number in party is to be supplied and emergency communication procedures agreed.

2. Activity Return forms

2a. In addition to Item 3 Schedule 2 the Concessionaire shall complete the Client Activity Return form attached as **Schedule 20** and return them quarterly to the Grantor no later than 14 days of the following dates.

A record of activity form must be submitted showing nil activity if no activity was undertaken.

- 31 March
- 30 June
- 30 September
- 31 December

3. Health and Safety

3a. In addition to **Item 16 Schedule 2** the Concessionaire must ensure that their safety plan is audited and certified by an auditor approved by the Grantor every three years at a minimum and must provide to the Grantor a copy of their re-certification no later than

December 2011, or within three years of their original certification to operate on the Land, whichever comes first.

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- 3b. The Concessionaire shall report to the Grantor within 7 days all injury and non-injury accidents, incidents and near misses (including delay and/ or unintentional separation of the parties) on the track and its environs relating to the activity. If the Grantor decides after reviewing the report and consultation with the Concessionaire that the standard of safety was not maintained as outlined in the Audited Safety Plan, the permit may be suspended or terminated.
- 3c. The Concessionaire shall ensure that all personnel employed by the Concessionaire for the activity will be suitably qualified and experienced. For this purpose and when requested by the Grantor the Concessionaire shall provide details of the relevant employees qualification and experience.

#### 4. Suspension

- 4a. The Grantor may suspend this Document if, in the opinion of the Grantor, there is a temporary risk to any natural or historic resource on or in the vicinity of the Land or to public safety whether arising from natural events such as earthquake, land slip, volcanic activity, flood, or arising in any other way, whether or not from any breach of the terms of this Document on the part of the Concessionaire.
- 4b. If, in the opinion of the Grantor, the activities of the Concessionaire, its employees, contractors, agents, clients or invitees are having or may have an adverse effect on the natural, historic or cultural values or resources of the land and the Grantor is of the opinion that the effect can be avoided, remedied or mitigated to an extent satisfactory to the Grantor, the Grantor may suspend this Concession until the Concessionaire remedies, avoids or mitigates the adverse impact to the satisfaction of the Grantor.
- 4c. The Grantor may suspend this Concession while the Grantor investigates any of the circumstances contemplated in clauses 4a and 4b and also while the Grantor investigates any potential breach or possible offence by the Concessionaire, whether or not related to the Concession Activity under the Conservation Act 1987 or any of the Acts mentioned in the First Schedule of that Act, of which the Grantor has become aware.
- 4d. The word “investigates” in clause 4c includes the laying of charges and awaiting the decision of the Court.
- 4e. During any period of temporary suspension the Concession Fee payable by the Concessionaire is to abate in fair proportion to the loss of use by the Concessionaire of the Land.
- 4f. The Grantor is not to be liable to the Concessionaire for any loss sustained by the Concessionaire by reason of the suspension of the Concession under clause 4 a, b or c including loss of profits.

#### 5. Effects of the activity

- 5a. The Grantor reserves the right to request further or different activity related information in order to best monitor and determine any effects of the Concession Activity on the Land.

5b. The Grantor reserves the right to apply restrictions to the Concession Activity, including but not limited to restricting the frequency of trips, number of clients per annum, reducing the maximum party size, or withdrawing all or part of the areas or activities approved in accordance with 17ZC(3)(b) of the Conservation Act 1987. The Concessionaire shall not be entitled to any compensation in the event of such action being taken.

5c. All costs attributable to the subsequent management of this concession which the Grantor incurs will be paid by the applicant on a cost recovery basis.

6. Weeds

6a. The Concessionaire shall take all precautions to ensure weeds are not introduced to the Land; this includes ensuring that all tyres, footwear, gaiters and packs used by the Concessionaire, its staff and clients are clean before entering the Land.

7. Didymo

7a. The Concessionaire shall comply and ensure its clients comply with all guidelines and notices issued by Biosecurity New Zealand to prevent and avoid the spread of the pest organism *Didymosphenia geminata* as specified by the website of Biosecurity New Zealand: <http://www.biosecurity.govt.nz/pests-diseases/plants/didymo/cleaning-methods.pdf>. The Concessionaire will update itself on this website on a regular basis. See also **Schedule 5**.

8. Hut fees/ permits

8a. Standard hut fees and camping fees are to be paid by both guides and clients to the hut warden or camp manager or if unavailable to the relevant Area Office on completion of the trip. (*or tickets to be purchased before the trip begins*)

8b. The Concessionaire is to ensure that all clients where required hold the appropriate passes, licences and permits, as follows:

- HUNTERS – Department of Conservation Hunting permit
- ANGLERS – Valid Fishing licence
- HUT USERS – Valid Backcountry Hut Tickets or Great Walk Passes (this does not give rights for reservation of hut space)
- DOG OWNERS – Permits for dogs

9. Facilities

9a. Toilets are to be used when camping in the vicinity of huts.

9b. Hut use will be on a first come first served basis and the Concessionaire and its clients together with all other concessionaires and their clients shall not be permitted to occupy more than half the bunk space of any hut unless the bunks would otherwise be unoccupied. The Concessionaire or its clients must carry alternative accommodation on all overnight trips operated under this concession and must not use a hut for more than two consecutive nights unless authorised by the Department's appropriate Area Manager.

9c. The Concessionaire shall ensure that when two groups from the same operator are in a hut the Concessionaire and guides should take all steps that are reasonably practical to keep them separate. This is to minimise the impact of a guided group on other hut users

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- 9d. The Concessionaire will ensure that its clients remain on formed tracks (or boardwalks) where possible.
- 9e. The Concessionaire shall note that the granting of this concession shall neither give nor imply that the Concessionaire has any guarantee of any access or facilities being preferentially allocated to the Concessionaire.
- 9f. The Concessionaire is not to mark, cut or construct any track on the land.
10. Camp sites
- 10a. The Concessionaire must ensure that permanent camps sites are not created on the Land, and that stores and caches of equipment are not left on the Land or in any hut, without the specific authority of the Department's appropriate Area Manager. .
11. Helicopter Use
- 11a. The Concessionaire shall ensure that any use of helicopters on the land shall be by an operator who holds a Department of Conservation concession for aircraft landings particular to the site of interest.
12. Kayaking / Rafting
- 12a. The Concessionaire shall use existing vehicle access and boat launching facilities where they exist.
- 12b. The Concessionaire shall ensure that any vehicle and trailer used by the Concessionaire or its clients does not restrict access to members of the public.
- 12c. The Concessionaire shall ensure that any boat and trailer used are removed when not in use. The Concessionaire acknowledges that this concession conveys no special rights or privileges regarding the use of boat ramp, jetty or any other facility.
- 12d. The Concessionaire shall take all practical measures to keep noise to a minimum and maintain the natural quiet of areas visited
- 12e. All persons involved in the activity wear correctly fitted life jackets when rafting or kayaking
13. Search and Rescue
- 13a. The Concessionaire will render all reasonable assistance if called upon during a Search and Rescue Operation.
14. Historic Places Act 1993
- 14a. Any historical or cultural artefacts found are to be left in place, location recorded and reported to the nearest Area Office as soon as possible.
15. Private land
- 15a. This Concession does not confer any right of access over any private land or public conservation land leased by the Grantor. Any arrangements necessary for access over private land or leased land are the responsibility of the Concessionaire. In granting this Concession the Grantor does not warrant that such access can be obtained.
16. Waahi Tapu

16a. The Concessionaire shall recognise the sensitivity of waahi tapu and urupa and seek guidance of iwi who claim manawhenua over any parts of the Land prior to providing interpretation on matters of iwi cultural significance.

17. Vehicle use

17a. The Concessionaire shall ensure that none of its vehicles or vehicles of its clients are taken off formed roads.

18. Vehicle parking

18a. The Concessionaire shall ensure that its vehicles and the vehicles of its clients are parked only in designated parking areas.

19. Animals

19a. The Concessionaire is to ensure that no animals including dogs or domestic pets are taken onto the Land by its clients

20. Interpretation materials

20a. The Concessionaire shall consult with and seek the guidance of iwi claiming manawhenua over any parts of the Land prior to providing interpretation on matters of cultural significance to such iwi.

20b. The Concessionaire shall provide detailed information of any historical, cultural or natural science interpretation provided by the Concessionaire to its clients in the course of the Concession Activity, to the Grantor, within thirty days of the date of any such written request by the Grantor.

20c. If the Grantor considers the interpretative material provided by the Concessionaire above unsatisfactory, the Concessionaire shall prepare an interpretation plan for approval by the Grantor within 60 days of advice from the Grantor that this is required.

21. Recordings of bird songs

21a. The Concessionaire shall not and shall ensure that its clients do not play recordings of bird songs on the Land

22. Grantor's Provision of Community Service, Benefit or Facility

22a. The amount to be paid by the Concessionaire to the Grantor in respect of the capital cost of providing any service, benefit or facility in terms of section 17ZH of the Conservation Act 1987 shall be apportioned by the Grantor as the Grantor thinks fit among those Concessionaires who benefit from such service benefit or facility. Such contribution shall be paid in one amount or over a period of years as the Grantor may determine.

22b. In addition to the contribution in 22a above, an annual contribution may also be required from the Concessionaires for costs of maintaining any such service, benefit or facility such contribution to be apportioned as the Grantor thinks fit among those Concessionaires who benefit from such a service, benefit or facility.

22c. The amounts determined in 22a and 22b above shall be due and payable to and recoverable by the Grantor on the expiration of 3 months after the service of the demand made on the Concessionaire by the Grantor. If such amounts are not paid by the due date then interest shall be payable in terms of clause 3 of Schedule 2.

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22d. If the amounts above are not paid in full by the due date, the Concessionaire shall be deemed to have committed a breach of the Concession.

23. DOC staff

23a. The Grantor may send any officer of the Department of Conservation on any of the activities authorised during the term of this Concession for the purpose of assessing both the impact thereof on conservation values, the standard of service offered and compliance with the terms and conditions of the Concession, at no expense to the Grantor.

## **SPECIFIC TO A CONSERVANCY**

### **East Coast Hawke's Bay Conservancy**

O. All employees and clients must comply with Te Urewera National Park Bylaws 2006. See **Schedule 8.**

24. All employees and clients must be made aware of the information on "Whitewater Duck: Whio (Blue Duck)" as provided by the Grantor (refer to **Schedule 6** attached).

25. Land adjoining Te Urewera National Park (particularly in the Whakatane River Track area) which is administered by the Tuawhenua Trust, cannot be accessed without obtaining prior written agreement from the land owner by contacting;

Jim Doherty  
Phone: (07) 366 3139  
Email: jmdoherty@tuhoe.co.nz

26. Bookings of Lake Waikaremoana Great Walk facilities for the Concessionaire (or his/her clients) will not be permitted between and including 20 December and 31 January annually.

27. Camp sites, Huts or Shelters (Te Urewera National Park - TUNP)

27a. The Concessionaire is permitted to use the following TUNP Great Walk huts;

- Marauti
- Panekiri
- Whanganui

27b. The Concessionaire is permitted to use the following TUNP Great Walk camp sites;

- Korokoro
- Maraunui
- Tapuaenui

27c. The Concessionaire is permitted to use the following TUNP Great Walk hut/camp sites;

- Waiharuru
- Waiopaoa

**GENERAL**

- Activities and locations approved are as follows subject to stated maximum party size, frequency and duration:

**East Coast Bay of Plenty Conservancy**

Location	Max. Party size (incl. guides)	Frequency of Use (trips) per year	Duration of visit (half or full day)	Persons x Frequency x Days = Total	Activity
<b>Lake Waikaremoana Great Walk Track</b> All Lake Waikaremoana Great Walk Huts & Campsites	12 pax	5	4 Days	240	Day Walks, Canoeing, Kayaking
<b>Te Urewera National Park</b> Sandy Bay Hut	12 pax	5	4 Days	240	Day Walks
<b>Te Urewera National Park</b> Manuoaoho Hut	12 pax	5	4 Days	240	Day Walks
<b>Te Urewera National Park</b> Nga Moko Track	12 pax	5	2 Days	120	Day Walks

**Wellington Hawke's Bay Conservancy**

Location	Max. Party size (incl. guides)	Frequency of Use (trips) per year	Duration of visit (half or full day)	Persons x Frequency x Days = Total	Activity
<b>Ruahine Forest Park</b> Comets Road End to Shutes Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Shutes Hut to Ruahine Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Shutes Hut to Road End via Dianes Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Upper Makaroro Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Parks Peak Road end via Sentry box Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Parks Peak to Colenso Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Parks Peak to Makaroro Road end	12 pax	5 Trips	3 Day	180	Day Walks
<b>Ruahine Forest Park</b> Yeoman Track	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Waipawa Forks to North Block road end via Waipawa	12 pax	5 Trips	1 Day	60	Day Walks

River					
<b>Ruahine Forest Park</b> North Block road end to Sunrise Hut	12 pax	15 Trips	1 Day	180	Day Walks
<b>Ruahine Forest Park</b> Loop tracks around Triplex Hut	12 pax	15 Trips	1 Day	180	Day Walks
<b>Ruahine Forest Park</b> Sunrise to Waipawa Forks	12 pax	15 Trips	1 Day	180	Day Walks
<b>Ruahine Forest Park</b> North Block road end to Smith Stream Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Smith Stream Hut to Waipawa Saddle	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Kashmir Road to Daphne Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Rosvalls Track	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Daphne Hut to Howletts Hut	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Daphne Hut to Longview via ridge	12 pax	5 Trips	1 Day	60	Day Walks
<b>Ruahine Forest Park</b> Howletts Hut to Longview via Ridge	12 pax	5 Trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Mangatutu Hot Springs, Te Puia Lodge, Makino Bivouac	12 pax	15 Trips	2 Days	360	Day Walks
<b>Kaweka Forest Park</b> Middle Hill Hut to Makino Bivouac	12 pax	5 Trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Makino Hut to Rocks ahead via Venison Tops	12 pax	5 Trips	2 Day	120	Day Walks
<b>Kaweka Forest Park</b> Makahu Saddle to Middle Hill Hut	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Makahu Saddle to Rocks ahead	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Rocks ahead to Kiwi Mouth via Manson Hut	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Kiwi Mouth to Lakes car park via Kiwi Saddle	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Kiwi Mouth to Cameron Car- park via ridge and Cameron Hut	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Lakes car park to the Lakes	12 pax	45	Half day	270	Short Walks
<b>Kaweka Forest Park</b>	12 pax	30	1 Day	360	Day Walks

Lakes car park to Cameron car park			DRAFT		
<b>Kaweka Forest Park</b> Makahu Saddle to Mackintosh Hut	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Mackintosh to Lawrence Hut and Road end	12 pax	5 trips	1 Day	60	Day Walks
<b>Kaweka Forest Park</b> Mackintosh to Castle Rock road end	12 pax	5 trips	1 Day	60	Day Walks
<b>Boundary Stream Mainland Island, Boundary Stream Scenic Reserve</b> Tumanako Loop Track Interpretation Nature Walk	12 pax	15	Half day	90	Short Walks
<b>Boundary Stream Mainland Island, Boundary Stream Scenic Reserve</b> Kaimahi Loop Track	12 pax	15	1 Day	180	Day Walks
<b>Boundary Stream Mainland Island, Boundary Stream Scenic Reserve</b> Shine Falls	12 pax	5	1 Day	60	Day Walks
<b>Boundary Stream Mainland Island, Boundary Stream Scenic Reserve</b> Bell Rock Loop Track	12 pax	5	Half day	30	Short Walks
<b>Bell Bird Bush Scenic Reserve</b> Bell Bird and G-String Caves	12 pax	45	Half Day	270	Caving, Day Walks
<b>Opouahi Scenic Reserve</b>	12 pax	30	3 Days	1080	Day Walks,
<b>White Pine Bush Scenic Reserve</b>	12 pax	15	Half Day	90	Short Walks
<b>Ahuriri Estuary Conservation Area</b>	12 pax	45	1 Day	540	Day Walks, Canoeing and Kayaking
<b>Ball's Clearing Scenic Reserve</b>	12 pax	5	Half Day	30	Short Walks
<b>Hutchinson Scenic Reserve</b>	12 pax	5	Half Day	30	Short Walks
<b>Elsthorpe Scenic Reserve</b>	12 pax	5	Half Day	30	Short Walks
<b>Mohaka River</b> Glenn Falls Recreation Reserve	5 pax	30	1 Day, 1 Night	150	Camping, Kayaking, canoeing and Tube Rafting
<b>Mohaka River</b> Bridget Campsite	5 pax	15	1 Day, 1 Night	75	Camping, Kayaking, canoeing and Tube Rafting
<b>Mohaka River</b> Everett's Campsite	5 pax	30	1 Day, 1 Night	150	Camping Kayaking, canoeing and Tube Rafting

- P. The Concessionaire must ensure that the Department's appropriate Area Office is advised of each overnight trip intention at least 1 day prior to the leave date. The name(s) of the guide(s) and number in party is to be supplied and emergency communication procedures agreed.

### **Hut Use**

- Q. Where the Concessionaire makes use of Department of Conservation administered huts, the Concessionaire shall enter relevant details of the activity into any hut book so provided by the Grantor

### **Use of toilets**

3. Toilets are to be used when camping in the vicinity of huts.

### **Private land**

4. This Concession does not confer any right of access over any private land or public conservation land leased by the Grantor. Any arrangements necessary for access over private land or leased land are the responsibility of the Concessionaire. In granting this Concession the Grantor does not warrant that such access can be obtained.

### **Co-siting**

5. In this clause "Co-site" means the use of the Concessionaire's structures or facilities on the Land by a third party for an activity; and "Co-sittee" and "Co-siting" have corresponding meanings.
6. The Concessionaire will not allow Co-Siting on the Land without the prior written consent of the Grantor.
7. The Grantor's consent must not be unreasonably withheld but is at the Grantor's sole discretion and subject to such reasonable terms and conditions as the Grantor thinks fit including a requirement that the Co Sitee be liable for direct payment to the Grantor of a concession fee and any environmental premium assessed in respect of the Co Sitee's activity on the Land.
8. In addition, the Grantor may withhold consent if:
- (i) the Co-Siting would result in a substantial change to the Concession Activity on the Land; or
  - (ii) the Grantor considers the change to be detrimental to the environment of the Land.
9. Subject to clause 8 the Concessionaire must, if required by the Grantor, allow Co- Siting on the Land;
10. Where the Concessionaire maintains that Co-Siting by a third party on the Land would:
- (i) detrimentally interfere physically or technically with the use by the Concessionaire of the Land; or
  - (ii) materially prejudice any resource consents obtained by the Concessionaire or cause more onerous conditions to be imposed on it by the relevant authority; or
  - (iii) obstruct or impair the Concessionaire's ability effectively to operate from the Land; or

- (iv) interfere with or prevent future forecast works of the Concessionaire

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the Grantor, will, as a pre-condition to consideration of an application to grant a concession to a third party, require that third party to obtain, at its own cost, a report prepared by an independent consultant acceptable to the Grantor confirming or rejecting the presence of the matters specified in this clause 12.4. The Grantor will not grant a concession to a third party, where the report confirms that the proposed concession would give rise to one or more of the matters specified in this clause 12.4.

11. If the independent consultant report rejects the Concessionaire's concerns, the Concessionaire may dispute this in accordance with the procedure set out in clause 22\_of **Schedule 2.**
12. Where the Concessionaire is required under clause 12.3 to allow Co Siting on the Land, the Concessionaire will, subject to clause 12.8 be entitled to enter into commercial agreements with third parties for them to conduct an activity on the Land and to receive a reasonable fee from them for any agreed activity they intend to carry out on the Land. If a dispute arises between the Concessionaire and a third party such dispute will be determined by the Grantor having regard to, but not limited to, the following matters:
  - (i) any written comment or submission of the Concessionaire and third party;
  - (ii) market value for the concession activity proposed by the third party having regard to the matters specified in Section 17Y(2) of the Conservation Act 1987;
  - (iii) any other matters the Grantor considers relevant.
13. If the Concessionaire does not accept the Grantor's determination, the Concessionaire may dispute this in accordance with the procedure set out in clause 22 of **Schedule 2.**
14. For the avoidance of doubt, a Co-Sitee permitted on the Land must enter into a separate concession with the Grantor in terms of which the Co-Sitee will be required to pay to the Grantor a concession fee and environmental premium assessed in respect of the Co-Sitee's activity on the Land. This separate concession will not contain provisions that conflict with the Concessionaire's rights and obligations in relation to the Land.
15. The Grantor will not authorise the third party to commence work on the Easement Land until all relevant resource consents are issued, an agreement is executed between the Concessionaire and third party, and any conditions imposed by the Concessionaire have been met.

#### **DOC staff**

16. The Grantor may send any officer of the Department of Conservation on any of the activities authorised during the term of this Concession for the purpose of assessing both the impact thereof on conservation values, the standard of service offered and compliance with the terms and conditions of the Concessions, at no expense to the Grantor.

#### **Use of tracks**

17. The Concessionaire shall ensure that, where provided, clients remain on formed tracks or well-used routes designed to protect natural and historic features of the Land and do not exceed any loading limitations placed on facilities and structures.

### **Camp sites**

18. The Concessionaire shall ensure that no permanent camp sites are created nor stores or cache of any equipment is left on the Land or in any hut without the specific authority of the Department's appropriate Area Manager.

### **Waahi Tapu**

19. The Concessionaire shall recognise the sensitivity of waahi tapu and urupa and seek guidance of iwi who claim manawhenua over any parts of the Land prior to providing interpretation on matters of iwi cultural significance and recognise the sensitivity of waahi tapu and urupa.

### **Vehicle use**

20. The Concessionaire shall ensure that none of its vehicles or vehicles of its clients are taken off formed roads.

### **Vehicle parking**

21. The Concessionaire shall ensure that its vehicles and the vehicles of its clients are only parked only in designated parking areas.

### **Animals**

22. The Concessionaire is to ensure that no animals including dogs or domestic pets are taken onto the Land by their clients.

### **Search and rescue**

23. The Concessionaire will render all reasonable assistance if called upon during a Search and Rescue Operation.

### **Weeds**

24. The Concessionaire shall take all precautions to ensure weeds are not introduced to the Land; this includes ensuring that all tyres, footwear, gaiters and packs used by the Concessionaire, its staff and clients are clean before entering the Land.

### **Interpretation materials**

25. The Concessionaire shall consult with and seek the guidance of Iwi claiming Manawhenua over any parts of the Land prior to providing interpretation on matters of cultural significance to such Iwi.
26. The Concessionaire shall provide detailed information of any historical, cultural or natural science interpretation provided by the Concessionaire to its clients in the course of the Concession Activity, to the Grantor within thirty days of the date of any such written request by the Grantor.
27. If the Grantor considers the interpretative material provided by the Concessionaire above unsatisfactory, the Concessionaire shall prepare an interpretation plan for approval by the Grantor within 60 days of advice from the Grantor that this is required.

**Recordings of bird songs**

1. The Concessionaire should not and ensure that its clients do not play recordings of bird songs on the Land

**Didymo**

29. The Concessionaire shall comply and ensure its clients comply with all guidelines and notices issued by Biosecurity New Zealand to prevent and avoid the spread of the pest organism *Didymosphenia geminata* see **Schedule 5** as specified by the website of Biosecurity New Zealand: <http://www.biosecurity.govt.nz/didymo>. The Concessionaire will update itself on this website on a regular basis.

**Caving**

30. The Concessionaire shall ensure that its staff, guides and clients are fully informed about the fragility of cave environments and associated flora and fauna and take all practical measures to avoid causing any physical damage.
31. The Concessionaire shall ensure that its staff, guides and clients do not touch any speleothems, whether soft or hard.
32. The Concessionaire shall ensure that its staff, guides and clients do not touch, disturb or remove any cave weta, cave spiders or their egg sacs, or other cave invertebrates.
33. The Concessionaire shall ensure that its staff, guides and clients do not touch or trample any plants in caves or at their entrances.
34. The Concessionaire shall ensure that its staff, guides and clients do not remove anything from the caves.
35. The Concessionaire shall ensure that its staff, guides and clients adhere to the code of ethics developed by the New Zealand Speleological Society.
36. The Concessionaire shall participate in any cave monitoring required by the Grantor.

**Activity return forms**

37. In addition to **Item 2 Schedule 1** the Concessionaire shall complete the Client Activity Return form attached as **Schedule 9** and return them quarterly to the Grantor no later than 14 days of the following dates. The Concessionaire shall complete the.

**Health and Safety**

38. In addition to **Item 11 Schedule 1** the Concessionaire must ensure that their safety plan is audited and certified by an auditor approved by the Grantor every three years at a minimum and must provide to the Grantor a copy of their re-certification no later than December 2012 or within three years of their original certification to operate on the Land, whichever comes first.

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39. The Concessionaire shall report to the Grantor within 7 days all injury and non-injury accidents, incidents and near misses (including delay and/ or unintentional separation of the parties) on the track and its environs relating to the activity. If the Grantor decides after reviewing the report and consultation with the Concessionaire that the standard of safety was not maintained as outlined in the Audited Safety Plan, the permit may be suspended or terminated.
  40. The Concessionaire shall ensure that all personnel employed by the Concessionaire for the activity will be suitably qualified and experienced. For this purpose and when requested by the Grantor the Concessionaire shall provide details of the relevant employees qualification and experience.

### **Concession Identification (ID) Cards**

41. That all guides clearly display Concessionaire Identification (ID) Cards when operating under this concession and that vehicle/vessel cards are displayed in the front, left hand side of the vehicle/vessel window with the details facing outwards.
42. That all guides hold a current first aid certificate.
  - o) That a guide is within the vicinity of his/her clients at all times, therefore available and ready to go to their assistance if required.

### **That all employees and clients adhere to the;**

43.
  - i. Environmental Care Code and the Water Care Code at all times (refer to **Schedule 4** attached).
  - ii. Wildlife Viewing Guidelines (refer to **Schedule 6** attached).
  - iii. Historic Places Act 1993 (refer to **Schedule 8** attached brochures).
  - iv. Be made aware of the information on “Whitewater Duck: Whio (Blue Duck)” as provided by the Grantor (refer to **Schedule 7** attached).
44. To observe the following conservancy special conditions listed below:

### **East Coast Bay of Plenty Conservancy**

#### **1. This concession does not;**

- a) Authorise the Concessionaire to carry out the concession activity on privately owned land, or waahi tapu areas adjacent to the Land (itemised in Schedule 1), without obtaining prior written agreement from the land owner.
- b) Authorise the Concessionaire to carry out the concession activity in the following areas;
  - i. Any private land adjacent to the Land (itemised in **Schedule 1**).
  - ii. Yellow highlighted areas of privately owned, or waahi tapu areas within the boundary of Te Urewera National Park (refer to **Schedules 10**).

- iii. Land adjoining Te Urewera National Park (particularly in the Whakatane River Track area) which is administered by the Tuawhenua Trust, without obtaining prior written agreement from the land owner by contacting;

Doris Rurehe  
Phone: (07) 366 3355  
Email: [rurehe@xtra.co.nz](mailto:rurehe@xtra.co.nz)

- c) Give nor imply preferential allocation of any access or facilities to the concessionaire.  
d) Grant exclusive use of any public facilities.

**2. The Concessionaire must note;**

- a) The Grantor or a nominated member of staff reserves the right to accompany the Concessionaire on concession activity trips (on up to two occasions each year) at no cost to the Grantor for the purposes of monitoring the Concessionaire's operation. It is accepted however that the monitoring trips will be arranged in advance with the Concessionaire at mutually acceptable times.  
b) All costs attributable to the subsequent management of this concession which the Grantor incurs will be paid by the applicant on a cost recovery basis.  
c) Bookings of Lake Waikaremoana Great Walk facilities for the Concessionaire (or his/her clients) will not be permitted between and including 20 December and 31 January annually.  
d) That during the following periods the Concessionaire (and his/her clients) will be permitted a maximum stay at any Lake Waikaremoana Great Walk hut/camp site as follows;

Date	Huts	Campsites
1 October to 30 April	<u>Two</u> nights stay	<u>Two</u> nights stay
1 May to 30 September	<u>Three</u> nights stay	<u>Five</u> nights stay

- e) That use of Department of Conservation Lake Waikaremoana Great Walk facilities is restricted to a **maximum** bunk/campsite space as follows (leaving the remaining space for the general public);

Huts	Campsites
<u>15 bunks per hut</u> (including guides/helpers)	<u>15 sites per campsite</u> (including guides/helpers)

- f) The Concessionaire is permitted to use the following huts;
- Marauti
  - Panekiri
  - Whanganui
- g) The Concessionaire is permitted to use the following camp sites;
- Korokoro

- Maraunui
- Tapuaenui

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- h) The Concessionaire is permitted to use the following hut/camp sites;
- Waiharuru
  - Waiopaoa
- i) While undertaking this activity the Concessionaire and/or their guides must carry an approved means of communication (i.e. a satellite phone or marine VHF radio device) in case of an emergency.

**NOTE:**

**Te Urewera National Park has NO cellular phone coverage.**

The above means of communication must be approved by the Te Urewera Area Office before commencement of this activity.

- j) All employees and clients comply with Te Urewera National Park Bylaws 2006 (see attached **Schedule 11**)
- k) That where required, all clients must hold the appropriate passes, licenses and permits, as itemised below;
- HUNTERS**
    - Department of Conservation hunting permit.
    - Permit to Hunt with Dog(s).
  - ANGLERS** - Valid fishing license.
  - HUT USERS**
    - Valid Backcountry Hut Tickets, or
    - Lake Waikaremoana Great Walk Passes (this does not give rights for reservation of hut space).
  - DOG OWNERS** - Permit to take dog(s) into all areas within the East Coast Bay of Plenty Conservancy.

**Wellington Hawke's Bay Conservancy**

**3. The Concessionaire must ensure;**

- a) That all employees/clients/competitors restrict their canoeing and kayaking activity to below (seaward of) the Embankment Bridge at the Ahuriri Estuary Conservation Area.
- b) That all employees/clients/competitors are made aware that they **do not enter/access land** in the following areas, belonging to the following Iwi Trust boards without first obtaining written permission.
- Kaweka Forest Park**
    - ***Owhaoko B & D Trust***  
(Refer to Schedule 12 - black highlighted land boundary)

c/- Administrators, P O Box 5, RATANA PA 5151

• **Owhaoko C Trust**

(West of the Ngaruroro River, from Kiwi Mouth South to Cameron Camp)

Marei Apatu

Phone: (06) 873 0978 (Work), 025 304 282 (Cell Phone)

Email: mareiapatu@ttoh.iwi.nz

ii. **Ruahine Forest Park**

• **Aorangi Awarua Trust**

(Refer to Schedule 13 - red highlighted land boundary;  
Ngaruroro/Rangitikei River)

c/- The Administrators, P O Box 5, RATANA PA 5151

Soraya Peke - Phone: (06) 342 6838 (Work), 027 270 7763 (Cell Phone)

Email: swpeke@xtra.co.nz

Awarua o Hinemanu Block

(Refer to Schedule 14 - red highlighted land boundary)

c/- Lisa Tuhi, 73 Sunderland Drive, Flaxmere, HASTINGS

Te Koau Trust

c/- Waru Allen, 131 Flaxmere Drive, Flaxmere, HASTINGS

- c) Prior to departure of any trip within the land to notify the following Supervisor or Manager of site location/dates/number of people in party or discuss hut availability and other relevant matters, conditions of usage may be set appropriate to each site;

Where he/she intends to use informal campsites within the Land, to notify the following Supervisor or Manager of site location/dates/number of people in party and other relevant matters;

- i. **Kaweka Forest Park - Eddie Te Kahika/Paddy Willems** (Puketitiri Field Centre) Phone (06) 839 8814, Fax (06) 839 8825
- ii. **Ruahine Forest Park - Ken Mills** (Ongaonga Field Centre) Phone (06) 856 6808, Fax (06) 856 6709
- iii. **For all other Hawke's Bay Areas -**  
Area Manager, Phone (06) 834 4857, Fax (06) 834 4869

**I. Variations to the Department's Standard Terms and Conditions of Independent Contract V1.5**

1. The Department's Standard Terms and Conditions of Independent Contract V1.5 are varied as set out in the sub-clauses below.

1.1. clause 3.3.1 is amended as follows,  
"The Supervisor must submit an invoice to the Contractor for each Fee Instalment at least one month before each Fee Payment Date.

1.2. clause 4.1 is amended as follows

**Payment**

4.1.1 (a) The Fee for the Services is specified in Schedule 1.  
(b) The Fee is payable by the Contractor to the Director General in the Fee Installments on the Fee Payment Dates specified in Schedule 1.

4.1.2 If the Director General does not receive payment from the Contractor on the time stated in Clause 4.1.1 the Contractor must pay to the Director General interest at the Penalty Interest Rate.

4.1.3 Interest is to be calculated on daily balances from the Fee Payment Date to the date of payment of the account by the Contractor.

1.3. clause 4.2 is deleted

1.4. clauses 5.1.4 and 5.1.5 are deleted

1.5. clause 5.12.2 is amended as follows:

"All reasonable costs and expenses, including legal costs and expenses as between solicitor and client incurred by the Director-General in remedying or attempting to remedy such default must be paid by the Contractor to the Director-General on demand together with interest at the Penalty Interest Rate."

1.6. clauses 5.13.9 and 5.13.10 are deleted.

1.7.

2. The annual contract/management fee will be waived for the term of the Contract if the work subject to this contract is completed to the Director-General's satisfaction.

**II. Biosecurity**

- DRAFT
2. The contractor must take all precautions to not transfer unwanted organisms (in particular soil borne organisms such as fungi and weed seeds, invertebrates] as listed under the Biosecurity Act 1993 in the carrying out of their services, by complying with the following:
    - 2.1 All vehicles must be free from all unwanted organisms, with special attention given to wheeled or tracked machinery, vehicles and ATVs;
    - 2.2 All items loaded onto vehicles must be free from unwanted organisms, with landscaping, track construction and re-vegetation supplies obtained from a 'clean' source;
    - 2.3 Methods and protocols for preventing unwanted organisms from entering or attaching themselves to the vehicles must be in place;
    - 2.4 The contractor must ensure that all personal gear, boots and clothing worn on site by contract staff has been checked and is free of all dirt, debris and unwanted organisms, with checks undertaken at the beginning and end of each work session at a given site;
    - 2.5 Check, clean and dry equipment between waterways. Fish, plants, rocks and other waterway components should not be moved between waterways;
    - 2.6 Those knowingly spreading an unwanted organism are liable under the Biosecurity Act 1993.

### **III. Fencing**

3. The Contractor shall repair the fence, gateway and supporting items identified in Schedule 5 as the 'fence line' to a stock proof level before introducing stock to the contract "site" and maintain the fence, gateway and supporting items to a stock proof level for the entirety of the contract.
4. The Contractor must also ensure that the gate identified in Schedule 5 can swing freely above the ground, is mounted on a suitable strainer and is fitted with a stock proof gate latch for the entirety of the contract.

# APPENDIX 6: LETTER TO POWELL WEBBER AND ASSOCIATES

DRAFT

Our Ref: 5/218000

4 March 2008

Powell Webber & Associates  
PO Box 37 661  
Parnell  
AUCKLAND 1151

Dear Grant

## NGATI PAHAUWERA – NIWA DAM REPORT

Thank you for the copy of the NIWA hydro dam report sent to me in September 2007 and as promised I have read and considered the content and information included in this, particularly that relating to river and gravel management matters. I have also copied off the relevant sections of the report relating to gravel management and sought comment from various Council staff, both with current and past experience, as to the detail and findings.

A significant amount of the information included in the report has been sourced from information supplied by our Council or its predecessor and is factually correct as extracted from these sources. My interpretation of this information tends to reinforce our current understanding of the Mohaka River, particularly the lower section as being a mudstone based channel with gravel alluvium being transported through these bedforms by high river flows or floods and material is extracted in a managed way as and when it is available in accordance with consented processes.

NIWA have questioned the determination of sustainable extraction rates and have revisited the bedload transport formulas as a means of determining likely gravel transport rates. Our earlier work determined a recommended annual extraction rate of 65,000m<sup>3</sup>/yr based on applying 2 empirical bed transport formula, being the Engelund-Hansen and Einstein-Brown formulas for 2 river sites, being Glenfield and Raupunga. This figure was reviewed down to 40,000m<sup>3</sup>/yr following joint discussions between ourselves and Ngati Pahauwera representatives in 1993. This reduction was seen to be an agreed conservative compromise as a means of allowing Ngati Pahauwera to assess the effect of this volume of extraction over a period with the ability to review the amount on an annual basis. This annual approach has seen the allocation figure fluctuate between 40,000 – 62,500m<sup>3</sup>/yr over the period of 1991 to 2008 for the reach of Mohaka River downstream of the TeHoe confluence. The actual annual volumes extracted are considerably less than this figure at approximately 27,000m<sup>3</sup>/yr.

NIWA have used Wilcock-Crowe models to determine a current and upper range of volumes, varying between 14,300 – 23,800 m<sup>3</sup>/yr and 77,800 - 163,900m<sup>3</sup>/yr respectively. All formulas are applied to a discharge rating with assumptions made for various factors, hence the wide range of values calculated. Considering the methodology and variables used to calculate the annual average bedloads it is not surprising that there will be a degree of difference between the volumes calculated. Due to this expectation other mechanisms such as visual inspections, aerial

photographs and rates of replenishment are also used as a means to determine what is actually happening on the ground and this information also forms part of the decision making process annually. The current actual annual extraction rate of approximately 27,000m<sup>3</sup>/yr is considerably less than the allocated volume and falls within an acceptable range with respect to theoretical sustainable limits calculated by various means. The question is whether the upper allocated limit, varying between 40,000 - 60,000m<sup>3</sup>/yr is too high and if extraction was allowed at this upper limit for a period of time whether this is sustainable. Our approach to date has to been to consider the variation on the upper limit on a year by year basis, taking account of annual influences such as floods, extraction beach levels and demand. Too date there have been no indicators to suggest that this approach is significantly flawed or causing adverse effects warranting a significant change in direction. Having said that we are also supportive of any initiatives that add to or improve our knowledge of these very dynamic processes.

Our belief is the current approach has a number of safeguards, as follows;

- There are vast sections of river where no access or extraction occurs.
- The mudstone channel is a natural control that limits degradation or significant lateral channel erosion.
- That input sources such as the Te Hoe river supply large volumes of gravel into the system.
- Peaks and troughs are to be expected within this system as there will be sporadic periods between floods, gravel movement and resource demand. Hence the need to consider a longer time frame.
- That long term volume records and trends indicate a relatively stable extraction rate within the range of calculated sustainable limits.
- Aerial photographic evidence of representative reaches of the river for the period 1943 to 2002 show little or no significance variance in gravel beach position or size.

QRS (Quality Roding & Services) as a local contractor have also provided information for the report with some statements being at odds with our records or understanding. I would make the following specific comments;

1. QRS's take from the lower Mohaka has ranged from 15,000 – 30,000m<sup>3</sup>/yr in recent years, while other extractors were taking 5,000m<sup>3</sup>/yr, with the average take being 20,000m<sup>3</sup>/yr.

*Comment: QRS's largest extraction year was 2003/04 @ 23,808m<sup>3</sup> and they have averaged 13,646m<sup>3</sup>/yr since their commencement in the river in 1998. QRS are also not privy to other extractors volumes so the comment about the 5,000m<sup>3</sup> is also not correct. The annual average extraction rates for the lower section of Mohaka River in the last 20 years has been 26,660m<sup>3</sup>/yr.*

2. QRS believe the gravel resource is being depleted with time, with the need to venture into the river to win gravel and chase gravel upstream.

Comment: QRS has advised that this statement only relates to beaches they work on, not as a comment on the whole system and has only happened in the last 2 years. For this period the statement would be correct as a larger volume has been extracted over the past 2 years with the absence of major floods. However this comment relates to a period too short to be representative of longer term trends and would be misleading with respect to overall supply.

3. *QRS's statements about beaches being replenished by floods, the depth of gravel, potential extraction sites not used and access are consistent with our knowledge.*

4. QRS currently take 50–60,000m<sup>3</sup>/yr from terrace gravels and quarries, with specific mention of Mossman's quarry.

Comment: QRS has confirmed that the 50-60,000m<sup>3</sup> was the volume from all quarries in the Wairoa District and that Mossman's quarry has never been used for roading contracts. Land based gravel extraction is a land use activity managed by the relevant Territorial Local Authority and as such our Council has no involvement or control over land based extraction.

5. In summary, QRS held the view that current extraction rates of 20,000m<sup>3</sup>/yr were not sustainable given re-supply rates from upstream.

Comment: QRS has confirmed that this statement only relates to beaches extracted by QRS and was not relating to the total volume. This also appears to relate to a very short time period of only the past 2 years and may have some relevance to this period. However we believe long term sustainability needs to relate to much greater periods of time where trends and responses to floods can be adequately considered.

QRS's comments need to be taken within the context given, which is a relatively short time frame and very site specific to their organisation. In our opinion these comments are not necessarily representative of the bigger picture.

While anecdotal evidence is probably adequate to support current and past practices with respect to gravel management in the Mohaka River there are other possible management and monitoring options that could be considered to provide more accuracy or confidence if necessary, such as;

- Perhaps a series of typical cross sections could be established to more formally determine river bed level variations or changes to these over time.
- Representative photos of fixed assets such as bridge pier structures could be taken as a means of determining bed levels relative to these structures over time.
- More regular aerial photos such as those taken in 1993 and 2008 could be considered.
- Further specific bedload transport work could be carried out between HBRC and NIWA.

In summary some of the information included in the NIWA dam report needs to be clearly considered within the specific context given, such as comments from QRS, particularly when being considered alongside longer term trends or information. Other areas such as calculation and determination of extraction limits have highlighted the considerable variances possible however these figures are not significantly outside acceptable bounds and more work can be done in this area. The report also highlights the value in reviewing approaches and techniques over time with the expectation of adding to or improving our understanding and management of these systems.

I trust the above comments and analysis are considered helpful and constructive and look forward to working with yourselves and Ngati Pahauwera representatives to further progress the above issues.

Yours Sincerely,

**Graeme Hansen**  
**Business Unit Manager – Works Group**

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Email: graeme@hbrc.govt.nz