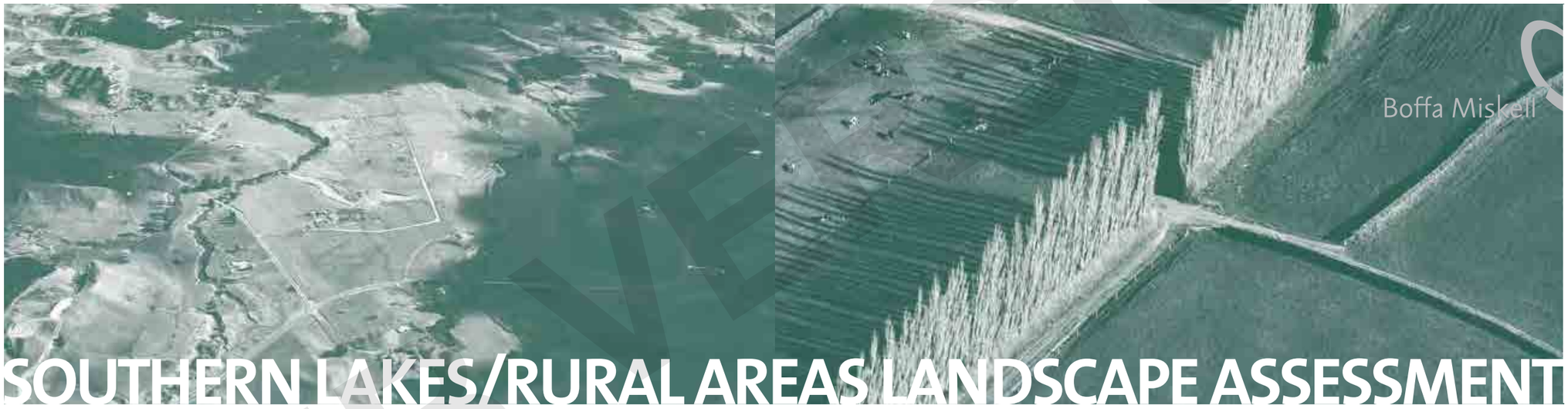

Boffa Miskell

SOUTHERN LAKES/RURAL AREAS LANDSCAPE ASSESSMENT

:: JUNE 2010

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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Prepared for

Rotorua District Council

PROFESSIONAL SERVICES CONTRACT NO. 07/038

by

Boffa Miskell Limited

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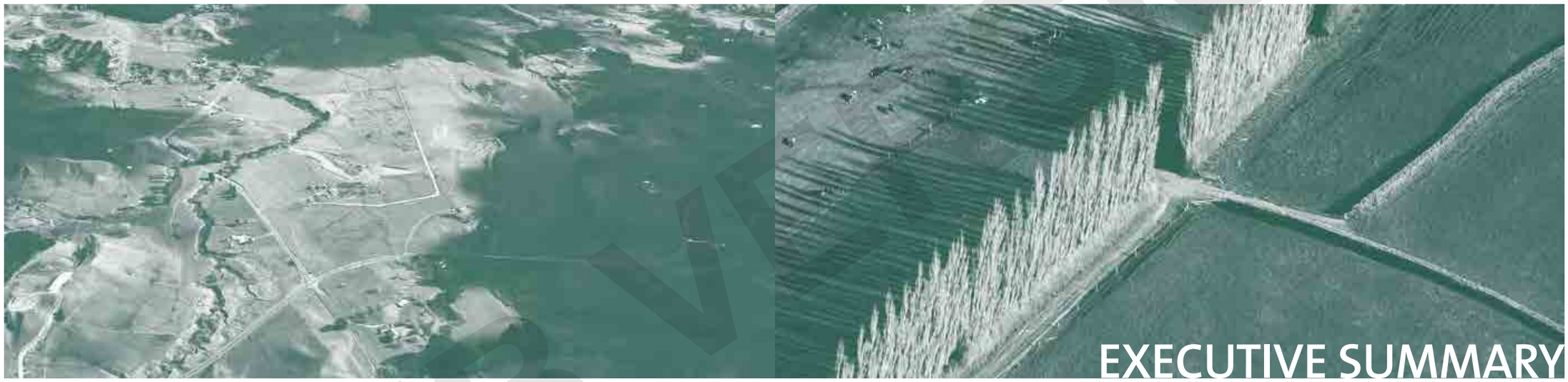
***Note**: The numbering of these landscape character types and landscape character areas follows on from the Northern Lakes Landscape Assessment, with the last Landscape type in that study being unit 9.0 – Rerewhakaaitu.*



EXECUTIVE SUMMARY

Southern Lakes Landscape Assessment

Introduction

This report documents Southern Lakes / Rural Areas Landscape Assessments commissioned by Rotorua District Council in 2007 (Professional Services Contract No: 07/038). Similar assessments have been undertaken for the Lake Rotorua Catchment, Northern Lakes and Eastern Lakes landscape assessment study areas. The study area boundary for the Southern Lakes/Rural Areas Landscape Assessment is shown as Figure 1.

The Landscape Types and Landscape Character Areas that are described in this report represent a spatial framework of landscape character within the Rotorua Southern Lakes / Rural Areas Landscape Assessment study area. The descriptions should be read in conjunction with the Landscape Types and Landscape Character Areas map and the base resource maps (Appendix 1: Study Area Resource Map Book – Maps 1–14) that have been used to assist in defining the Landscape Types and Landscape Character Areas (refer to Methodology section below for definitions).

The assessment methodology for this study has firstly involved a Landscape Character Assessment process that then provided a framework for the second stage, which has involved identifying "Outstanding Natural Features and Landscapes" (ONFL).

The *"protection of outstanding natural features and landscapes from inappropriate subdivision use and development"* is a matter of national importance under Part II Section 6(b) of the Resource Management Act 1991 (the RMA). The identification of such features and landscapes and the provision of appropriate objectives, policies and methods for their recognition and protection is a responsibility of District Councils. The RMA does not define 'landscape' or 'outstanding'. However, the standard dictionary definition of 'outstanding' to mean 'eminent especially by excellence', and 'conspicuous' are generally adopted to provide guidance to the determination of outstanding natural features and landscapes.

Section 6(b) relates to other matters of national importance such as Section 6(a) in regard to the preservation of the natural character of wetlands and lakes and rivers and their margins and the protection of them from inappropriate subdivision, use and development.

Cultural landscapes of significance to Maori were also identified through a consultative process. These have been mapped and are referred to throughout this assessment and in the section on cultural landscapes.

Landscape Management Issues are also identified for each of the thirty (30) Landscape Character Areas. These issues identify specific landscape management outcomes that are desirable within each Landscape Character Area. When an application for resource consent is made in a specific Landscape Character Area, it is intended that an applicant will refer to these issues and incorporate measures into the design of the proposal or assessment of effects that align with the management of these issues where these are relevant to the site and / or application.

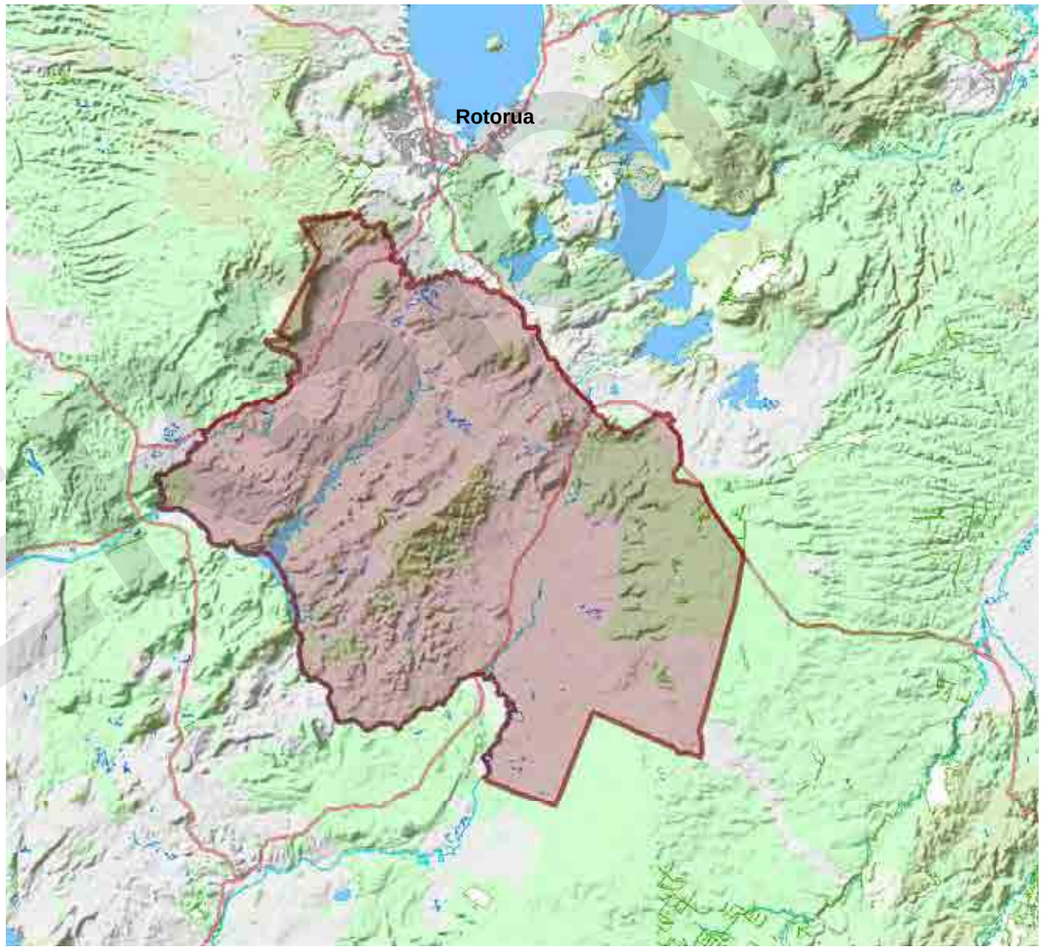


Figure 1: Study area boundary for the Southern Lakes/Rural Areas Landscape Assessment

Uses of Landscape Character Assessment

Landscape Character Assessment is a means of enabling Council, landowners and communities to understand what the landscape is like now, how it came to be the way it is and how it may change in the future.

In this way the Lake Rotorua Catchment Landscape Assessment aims to assist Council, landowners and communities to understand landscape change, its drivers and the threats and vulnerabilities to the existing landscape. Once the landscape characteristics and values of the Lake Rotorua catchment landscape are understood, guidance in relation to appropriate forms of protection, productive land use, development, enhancement or rehabilitation can be provided.

Ways in which Landscape Character Assessment can help achieve integrated land use planning and management include:

Land Use Planning

- Providing a spatial framework for informing strategic policy development at the District wide (District Plan and LTCCP), structure planning, community planning and asset management planning at the local level.
- Studies of development potential, i.e. to help in identifying appropriate areas for managed development / growth on the urban fringes and in rural environments.
- Informing the siting, scale and design of particular forms of development, such as cluster housing or rural residential development.
- Contributing to landscape capacity studies relating to the supply of land for housing, rural activities and forestry use.
- Providing a cohesive integrated landscape resource document to assist landowners/applicants in preparing assessments of environmental effects and applications for resource consent.
- Providing a spatial framework for planning consistency with wider regional and national policy instruments and initiatives such as Rotorua Lakes Protection and Restoration Action Programme.
- Providing a base line against which future landscape change and the affect of landscape protection and management measures in the District Plan can be monitored.

Landscape Management

- Providing a basis for the identification of landscape management issues, objectives and the preparation of appropriate landscape management strategies including protection, development, altered forms of production, enhancement or rehabilitation.
- Providing a strategic spatial framework for inter-agency co-operation and initiatives (Environment Bay of Plenty [EBOP], Department of Conservation [DoC]).
- Informing work on special areas including areas for designation, mapping of boundaries, justifications for special application of policies.
- Helping to guide land use in positive integrated ways to ensure the efficient use of natural and physical resources and to promote landscape integrity - the idea of integrated land use planning and management within the context of sustainable management and the RMA.

The principal expected outcomes of this Lake Rotorua Catchment Landscape Evaluation project are therefore:

- To inform decision making at Council, landowner stakeholder and community levels,
- To provide for the recognition and appropriate protection of outstanding natural features and landscapes (RMA Section 6(b)),
- To assist in the formulation of strategic landscape policy provisions,
- To guide land use change, and the siting, carrying capacity and form of future development,
- To provide a basis for the formulation of landscape management strategies and plans,
- To facilitate community landscape enhancement initiatives, and
- To provide a framework and basis for ongoing studies.

What is “Landscape”?

Landscape is a physical resource that is the result of natural and cultural processes occurring over time. All landscape has undergone past change and will continue to be modified by both natural processes and cultural activities. The landscape that we see is influenced by our own individual cultural heritage and perceptions. People with an urban upbringing will see and experience rural landscapes or the relative wilderness of natural areas differently to the people who live within and make their living from the rural landscape.

Councils have a statutory responsibility to protect outstanding natural landscapes and features (Section 6 RMA) as well as the more general amenity values of landscape (Section 7 RMA). It is, however, landowners who have the ultimate responsibility for land management and the husbandry or stewardship of the landscape resource.

Landscape in its broadest context incorporates a range of characteristics and attributes including the following:

- Geomorphological – underlying geological processes, structure and resultant topography,
- Hydrological – the patterns of water movement and collection,
- Ecological – dynamic organic components and processes,
- Transient – ephemeral, seasonal, temporal and atmospheric,
- Aesthetic – coherence, vividness, naturalness,
- Legal / Economic – patterns of ownership, use and productivity,
- Community/Social – scenic, shared and recognised values,
- Cultural – tangata whenua values and associations,
- Historic – sites, areas, buildings, features, elements and events.

These attributes together contribute to our perception, understanding and appreciation of landscapes.

Methodology

This report is based on a landscape characterisation methodology that delineates and describes an integrated spatial framework of 'landscape types' and 'landscape character areas' that provide a means of understanding the varied landscape character within the study area.

This framework can be thought of as a number of ordered sets of interconnected landscapes from large to small each with their own distinct landscape characteristics that are "nested" together.

Landscape Types are derived from the underlying geology / topography. They are

- Generic
- Allow different landscapes to be compared
- Have similar characteristics in different areas

Landscape Character Areas are derived from the combination of landform, land cover and land use. They are:

- Unique areas;
- Geographically / space specific;
- Have individual identity but can share generic character with other areas

In applying this method of landscape character assessment the smaller the scale the greater the level of assessment detail needed. The above approach is demonstrated in the following diagram that illustrates the idea of a nested hierarchy of landscape areas and the landscape management techniques that can be applied at each scale of the landscape.

The approach and methodology adopted for this study has been based on desktop (GIS) and field surveys (road / public walkway access). For those parts of the study area where terrain and public road access limited ground based fieldwork, desktop analysis has been supplemented by aerial (helicopter) survey.

The following GIS based datasets have been used in the analysis:

- NZMS 260 Topographic Series
- Aerial Photography (Rotorua District Council, 2001 and 2006)
- Elevation (NZMS 260 and Rotorua District Council)
- Underlying Geology (New Zealand Land Resource Inventory)
- River Environments Classifications of New Zealand (NIWA)
- Land Cover Data Base (Landcare Research)
- Land Use Capability Units (Landcare Research) (see Appendix 2 for an explanation of Land Use Capability)
- Archaeological Sites and Geopreservation Sites (New Zealand Archaeological Association and Environment Bay of Plenty)
- Rotorua Cultural Landscapes (Boffa Miskell)
- Land areas previously identified by Environment Bay of Plenty as outstanding natural features and landscapes (Environment Bay of Plenty, 1997)
- Department of Conservation (DoC) Reserves
- Operative Rotorua District Plan and Planning Maps

Summary of Results

This report identifies and describes 9 Landscape Types and 30 individual Landscape Character Areas within those larger Landscape Types. These areas have been defined and mapped on the basis of:

- underlying geology and associated topography;
- existing landcover;
- land use capability;
- natural drainage patterns;
- existing cultural land uses; and
- settlement patterns.

Four natural features and landscapes are identified in the study area (see Assessment Criteria Worksheets and Appendix 1: Map 13):

- Waiotapu Geothermal Area (11.2)
- Tumunui Hill (12.1)
- Paeroa Range Western Scarps (12.7)
- Horohoro Dome and Escarpment (18.3)

Integrating landscape assessment and planning processes

Boffa Miskell

Selected Study Area: Southern Lakes/Rural Areas

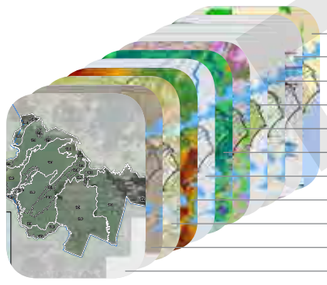
One of four study areas in the District.

Lake Rotorua Catchment

Rotorua District Council Boundary

RESOURCE EVALUATION: Document One

Landscape Analysis & Assessment Process: GIS Data Sets , Fieldwork & Consultation



Zoning
Underlying Geology
Topography
Elevation
Drainage Patterns
Land Cover
Land Use Capability
Archeological Sites
Protected Natural Areas
DoC Reserves
Aerial Photography

GIS Data Sets

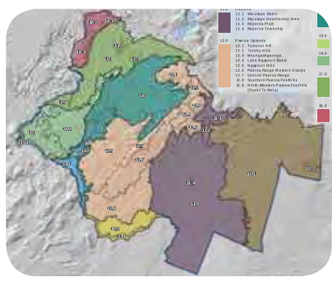
+

Fieldwork

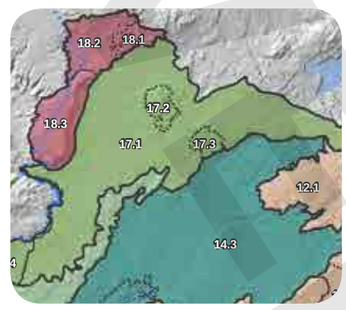
+

Consultation

The Development of an Integrated Spatial Framework of Landscape Areas



Identification of Landscape Types & Landscape Character Areas



Landscape Types:

> First order delineation based on geomorphology/landform

> Define areas of broad similarity

Landscape Character Areas:

> Based on landform, landcover and land use

> Homogenous areas with distinctive landscape characteristics

> Sub areas of a landscape type

Applying Specific Assessment Criteria

eg. Outstanding Natural Features & Landscapes

LANDSCAPE MANAGEMENT: Document Two

Structure Planning

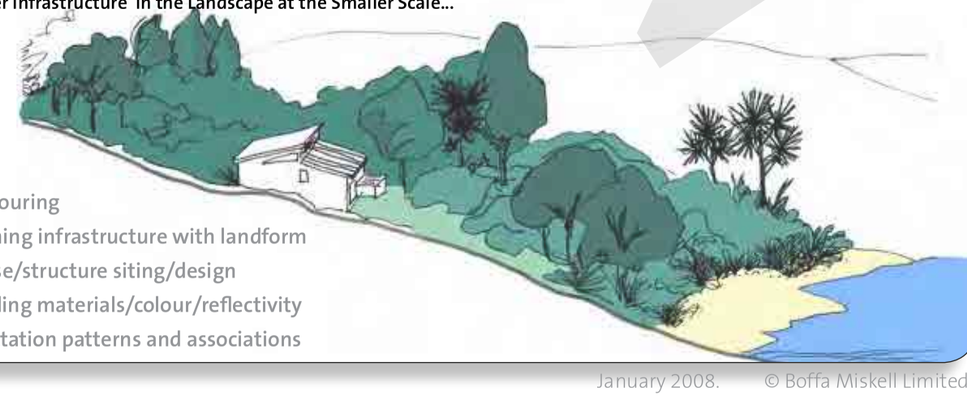
Recognising Landscape Character at the Broader Landscape Scale to inform...

Landscape Analysis & Planning at the Site Specific Scale

Development outcomes that do not work with landscape attributes and character

Development outcomes that work with landscape attributes and character

...Design Guidelines for the Placement & Integration of Earthworks, Buildings, Access and other Infrastructure in the Landscape at the Smaller Scale...



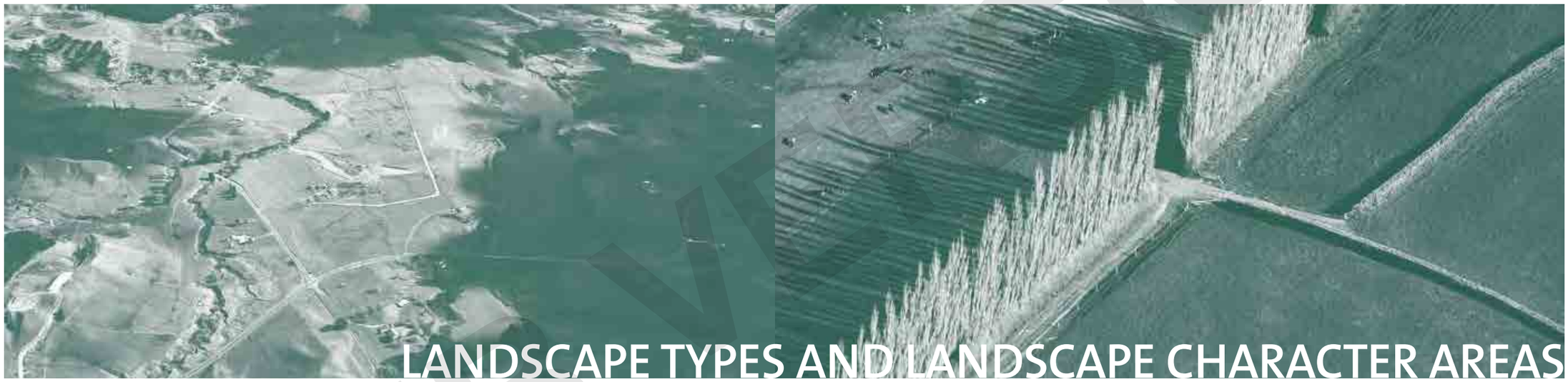
> Contouring

> Aligning infrastructure with landform

> House/structure siting/design

> Building materials/colour/reflectivity

> Vegetation patterns and associations



LANDSCAPE TYPES AND LANDSCAPE CHARACTER AREAS

Landscape Types and Landscape Character Areas

***Note**: The numbering of these landscape character types and landscape character areas follows on from the Northern Lakes Landscape Assessment, with the last Landscape type in that study being unit 9.0 – Rerewhakaaitu.*

10.0 KAINGAROA

- 10.1 Kaingaroa Forest Plateau
- 10.2 Kaingaroa Forest Settlement

11.0 REPOROA

- 11.1 Waiotapu Basin
- 11.2 Waiotapu Geothermal Area
- 11.3 Reporoa Plain
- 11.4 Reporoa Township

12.0 PAEROA UPLANDS

- 12.1 Tumunui Hill
- 12.2 Tutehu Hills
- 12.3 Maungaongaonga
- 12.4 Lake Ngapouri Basin
- 12.5 Ngapouri Hills
- 12.6 Central Paeroa Range
- 12.7 Paeroa Range Western Scarps
- 12.8 Southern Paeroa Foothills
- 12.9 North-Western Paeroa Foothills (Puaiti/Te Weta)

13.0 WAIKATO RIVER

- 13.1 Waikato River
- 13.2 Waikato River Northern Bank

14.0 LAKE OHAKURI AND SURROUNDS

- 14.1 Lake Ohakuri
- 14.2 Lake Ohakuri and Whirinaki Valley
- 14.3 Whirinaki Basin

15.0 ATIAMURI

- 15.1 Lake Atiamuri and Margins

16.0 NGAPOIPOIATORE/POUTAKATAKA HILLS

- 16.1 Ohakuri Road Terraces
- 16.2 South-Western Hills and Poutakataka Ridge

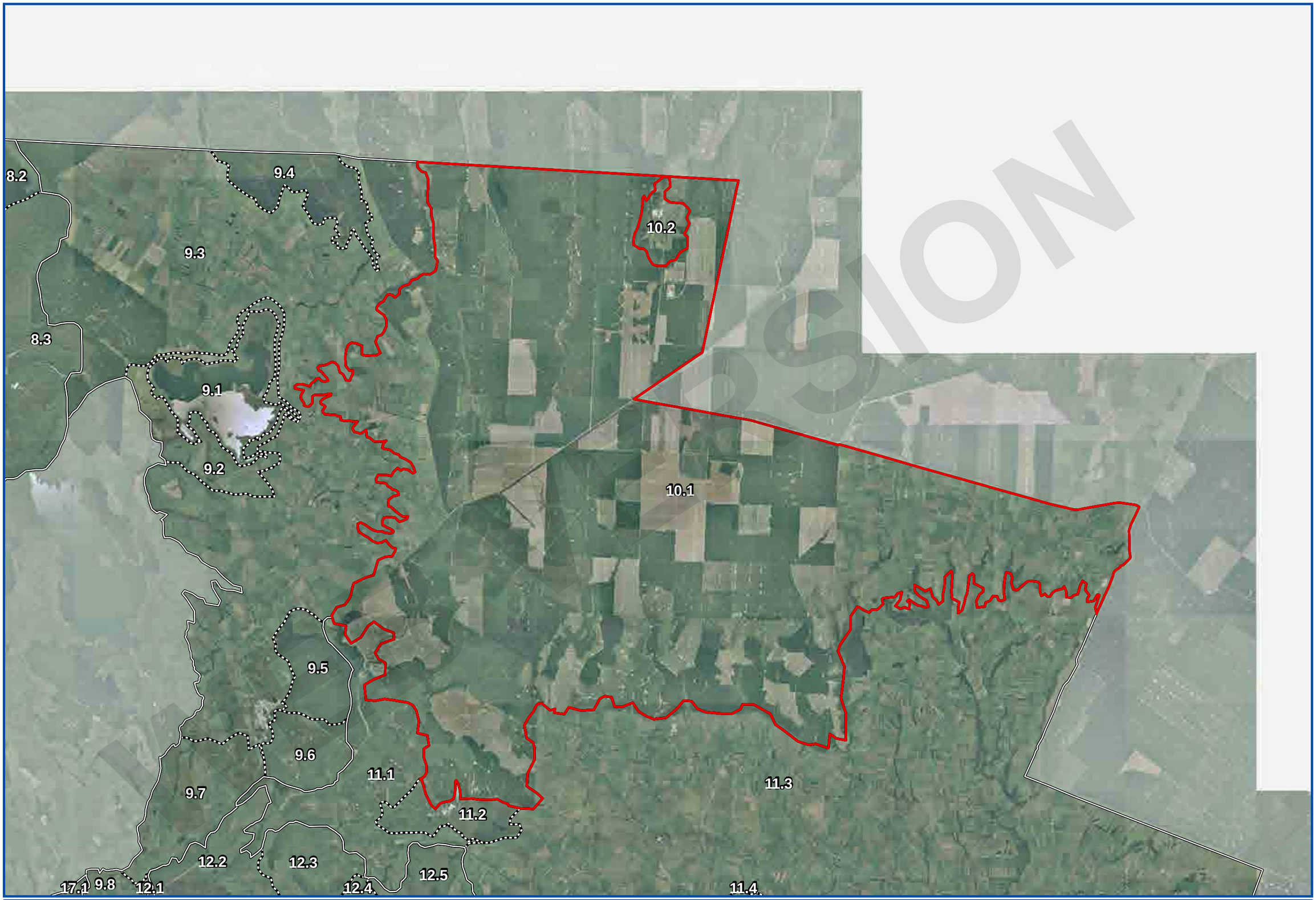
17.0 WAIREKA

- 17.1 Waireka Valley
- 17.2 Haparangi
- 17.3 Ongahoro
- 17.4 Tahunaatara Stream North

18.0 HOROHORO

- 18.1 Tureporepo Hills
- 18.2 Pokaitu Basin
- 18.3 Horohoro Dome and Escarpment

10.1



Kaingaroa Forest Plateau

0 0.5 1 km

1:100,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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10.0 KAINGAROA

Landscape Character Area 10.1: Kaingaroa Forest Plateau

Area Defined by:

- Lower elevation pasture land of Rerewhakaaitu to the north (Character Area 9.2 in the Rotorua Northern Lakes Landscape Assessment).
- Western Kaingaroa Forest Plateau rise (from Reporoa Valley) in the west.
- Rotorua District Boundary with Taupo District in the south.
- Rotorua District Boundary with Whakatane District in the east.

Area Characterised by:

- Broad and expansive elevated volcanic plateau characterised by very loosely consolidated breccia material forming areas of extensive flat dissected terrain particularly in the east easing to more diverse and dissected terrace and gully landforms north of the Ngatamawahine Stream corridor and to the west in association with west draining stream systems. Breccia material highly susceptible to gully, tunnel, stream bank and sheet erosion.
- An area of predominantly Class 6 rolling and dissected hill terrain defined by the Waikokomika and Mangaharakeke Stream systems in the northwest (see Map 8 and Map 6).
- Flat to gently undulating terrain predominates with steep to very steep stream gullies and rolling to strongly rolling hill country as the plateau rises from the Reporoa Valley in the west (see Map 4).
- Class 3 and 4 land dominates with Class 7 land identified within dissected stream corridors and steeper transitional hill country on the western area edge (see Map 8).
- Drainage patterns characterised by minor east draining tributaries of the upper Mangaharakeke Stream system in the north; upper sub-catchments of three principal west draining stream systems that drain to the Rangitaiki River in the east (within the Whakatane District) – two unnamed and the upper Waitaruna Stream; west draining upper sub-catchments of the Waiotapu Stream system including the Mangaharakeke, Tokaiminga, Wharekaunga, Mangatete, Torepatutatu Stream systems (see Map 6).
- Landcover characterised by production pine forestry in various harvest rotation block grids with areas of pasture to the north of Northern Boundary Road and south of the southern branch of the upper Mangatete Stream. Limited areas of indigenous forest also feature within steeper stream gullies and plateau scarps (see Map 7).
- Harvest access roads.
- Predominantly Maori land holdings.

Local Character Areas:

- North-Western Hills
- Northern Boundary Road Pasture Land
- Production Forest Plateau
- Southern Pasture Land

Landscape Management Issues:

- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities.
- Protection of areas of indigenous vegetation associated with riparian margins / stream systems.
- Adoption of industry best practice guidelines in the management of soil and water quality issues for pastoral land uses.

10.2

Kaingaroa Forest Settlement

0 0.5 1 km

1:10,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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ROTORUA DISTRICT COUNCIL

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10.0 KAINGAROA

Landscape Character Area 10.2: Kaingaroa Forest Settlement

Area Defined by:

- Plantation forestry immediately south of an unnamed east draining stream tributary of the Rangitaiki River.
- Kaingaroa production forestry plateau to the west and south.
- Dissected eastern plateau edge hill country to the east.

Area Characterised by:

- Industrial forestry and production facilities to the north of Dun Road (see Map 3 and Map 2).
- Recreational facilities (Kaingaroa Golf Course) to the north west – including air field.
- Kaingaroa School and grounds.
- Residential sub-urban settlement to the south of Dun Road. (population 486 as per 2006 census)

Local Character Areas:

- Industrial North
- Residential Settlement Areas

Landscape Management Issues:

- Management of community recreational facilities including open space, linkages and connections.
- Protection of community, educational and residential landscape amenity in relation to industrial land uses.
- Management of industrial waste and water usage.
- Predominantly Maori land holdings.

11.1

Waiotapu Basin

0 0.5 1 km

1:30,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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11.0 REPOROA

Landscape Character Area 11.1: Waiotapu Basin

Area Defined by:

- Waimangu South Hill country, Maungakakaramea and SH5 to the north.
- Maungaongaonga, Hill 8566 (NZMS 260) and associated foot hills to the west.
- Reporoa Valley to the south.
- Kaingaroa rolling hill country to the east.

Area Characterised by:

- A variety of underlying geology ranging from harder volcanic to more unconsolidated material characterised by active geothermal features, lakes and streams (see Map 5).
- Surrounds Waiotapu Geothermal area.
- Land use capability classifications range from Class 6 in foothill and softer erosion prone areas to Class 4 land associated with moderately sloped terrain within the Waiotapu basin (see Map 8).
- Drainage patterns include upper western subcatchments of the Waikokomuka Stream including Lake Ngahewa (Lake Ngahewa Recreation Reserve – DoC) and associated wetlands to the south of SH5; Also includes areas of the Hakareteke Stream and Te Kapakapa Stream catchments and corridors as well as upper catchment areas of the Waiotapu Geothermal lakes to the east (see Map 6).
- Landcover characterised by pine and pasture with small (<10ha) patches of indigenous forest cover associated with Lake Ngahewa and upper Waikokomuka Stream corridor (see Map 7).
- Lake Ngahewa one of thirteen lakes vested with Te Arawa lakes Trust

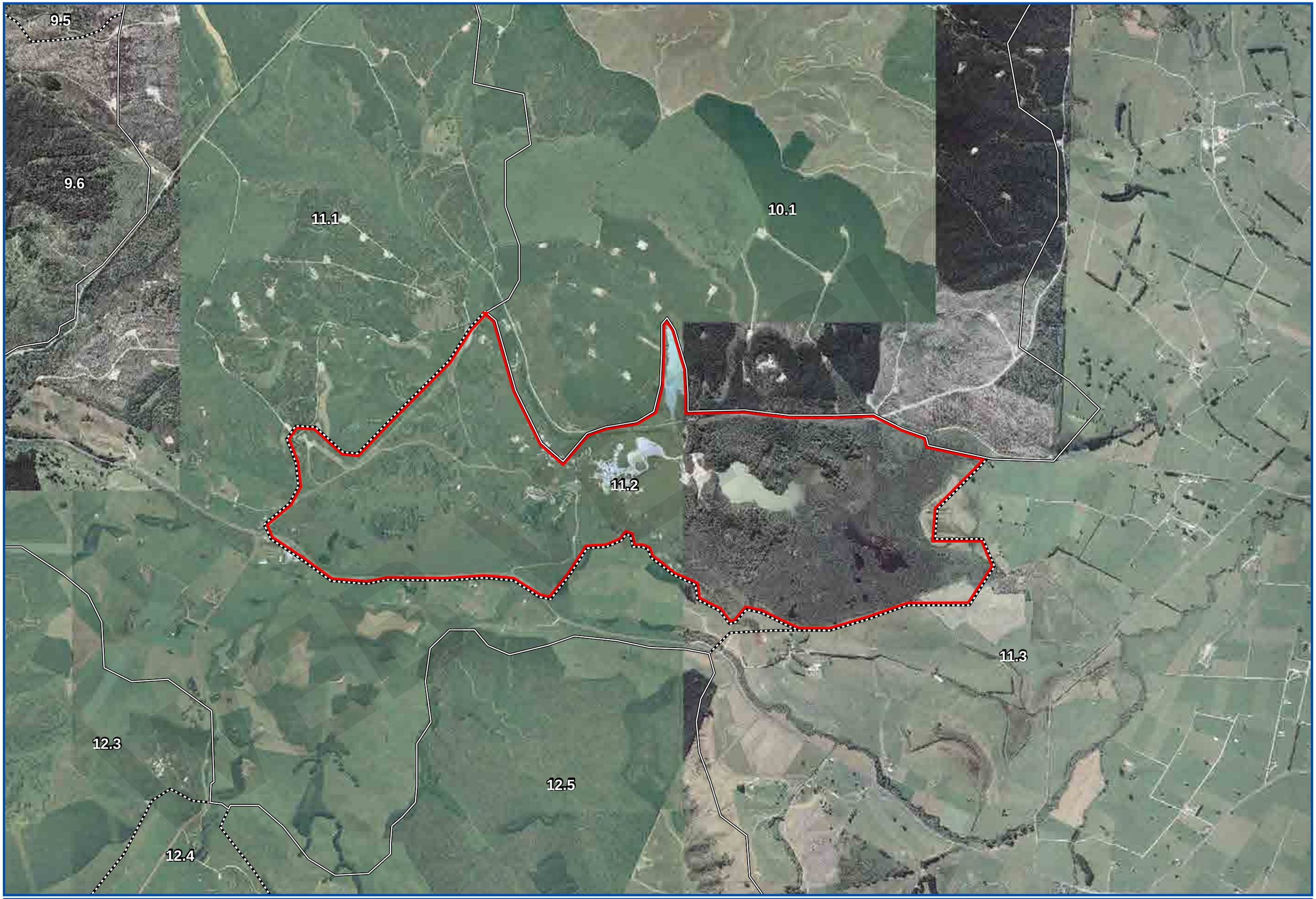
Local Character Areas:

- Lake Ngahewa
- Production Foothills (exotic and pasture)

Landscape Management Issues:

- Management of scenic and amenity landscape resources regarding Lake Ngahewa in relation to existing Sate Highway lay-by facilities.
- Appropriate land use management practices in relation to sedimentation, water quality and geothermal resource issues for areas adjoining the Waiotapu Geothermal area as the extent of underground geothermal fields may extend beyond the immediate surface expressions of geothermal activity.

11.2



Waiotapu Geothermal Area

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

- Landscape Type
- Landscape Character Area
- Rotorua District Council Boundary

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11.0 REPOROA

Landscape Character Area 11.2: Waiotapu Geothermal Area

Area Defined by:

- Waiotapu Loop Road and adjoining production forestry area to the north.
- SH5 and the eastern Waiotapu Stream corridor to the west.
- Campbell Road pasture land to the south.
- Production forestry to the east.

Area Characterised by:

- Geopreservation areas / geothermal fields and features including hot springs; geysers; fumaroles; steaming ground; mud volcano; sinter; collapse holes; hydrothermal breccia, large number of recent hydrothermal explosion craters (see Map 9).
- Named geothermal features include, Artist's Palette-Primrose Terraces (Largest, finest active silica terrace in New Zealand), with associated amorphous metallic sulphides. The Waiotapu halotrichite deposit; Waiotapu collapse craters; Lady Knox Geyser; Waiotapu, Loop Road Mud Volcano; Kerosene Creek hot waterfall.
- Waiotapu Scenic Reserve and associated stewardship areas (DoC) and allied indigenous landcover including interspersed patches of broadleaved indigenous hardwoods and kanuka / manuka shrublands (see Map 10).
- Drainage patterns characterised by sub-catchments of the Waiotapu Stream system and include numerous open water body features including Lakes Orotu, Ngahoro, Whangioterangi and the "Champagne Pool" (see Map 6).
- Access roads and associated recreational facilities.
- Significant Maori land holdings in the east.
- Early Maori settlement and occupation (see Map 12).

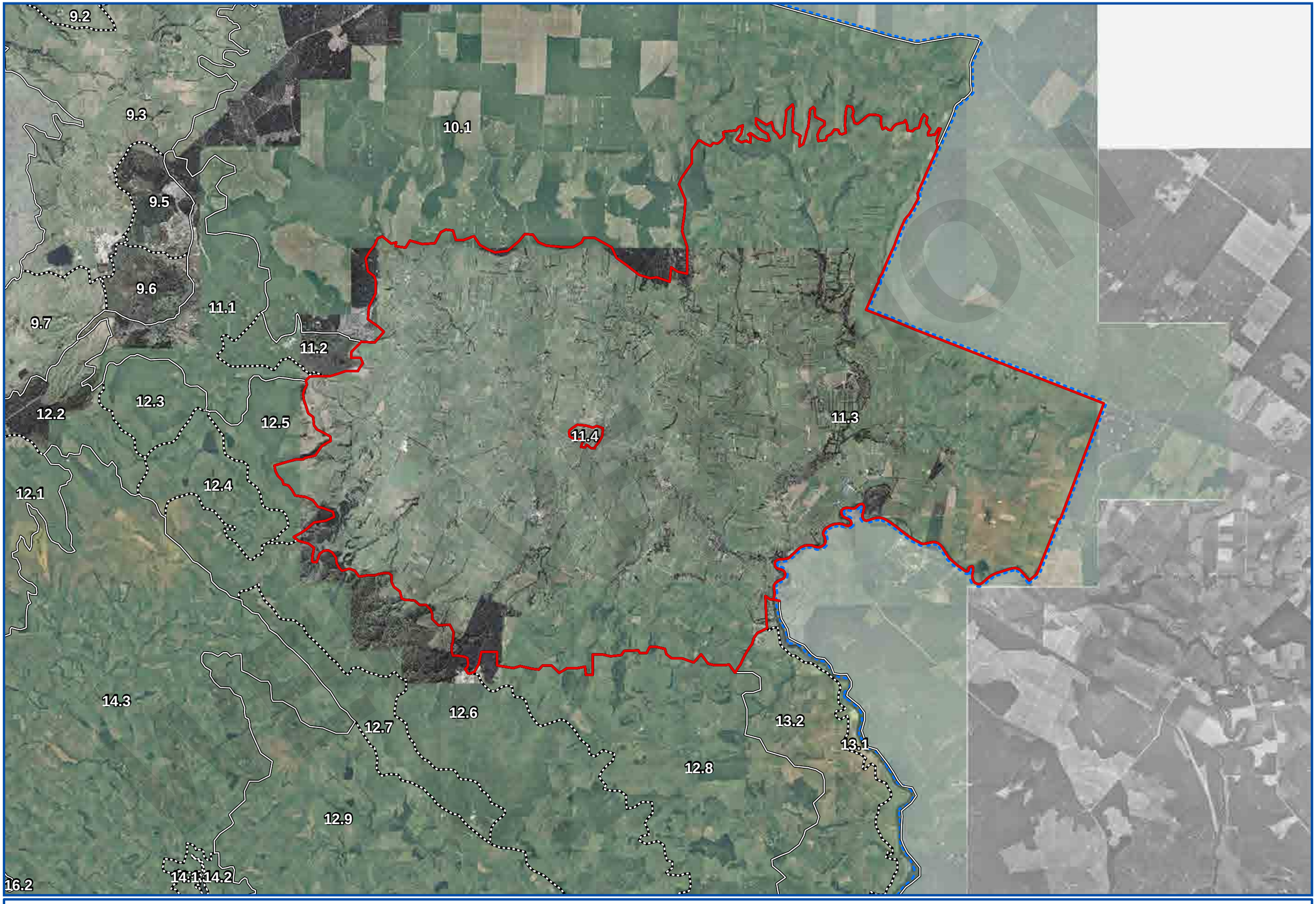
Local Character Areas:

- Named Geothermal Features
- Bushland Surrounds

Landscape Management Issues:

- Recognition of Regional Council (Environment Waikato) identified threats to Geothermal resources and methods of protection including identification, classification and monitoring programmes.
- Management of scenic and amenity landscape resources and associated facilities.
- Protection of geothermal features.
- Appropriate location, siting, scale and design finishing of constructed elements including roading and access in relation to geothermal features and surrounds.

11.3



Reporoa Plain

0 0.5 1 km

1:100,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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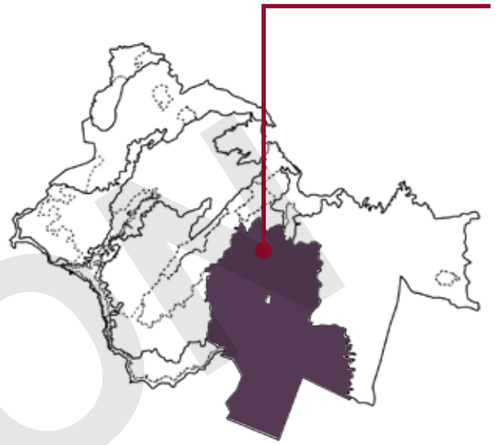
11.0 REPOROA

Landscape Character Area 11.3: Reporoa Plain



Area Defined by:

- Waiotapu Geothermal area, Hill 8566 (NZMS 260) and Kaingaroa rolling hills in the north.
- The eastern foothills of the Paeroa Range in the west.
- The Waikato River and Rotorua District boundary with Taupo District in the south.
- The Kaingaroa Forest plateau rise to the east.

Area Characterised by:

- Broad valley flood plain landform of flat to undulating terrain characterised by volcanic alluvium and unconsolidated parent materials with limited areas of harder volcanic base rock that are reflected in more elevated terrain dome features (see Map 5 and Map 4).
- Class 3 lands predominate with significant areas of Class 4 land and limited areas of Class 6 land associated with more elevated harder volcanic underlying geology and western and south eastern rolling foothill areas (see Map 8).
- Drainage patterns of the Waiotapu Stream and Torepatutahi Stream systems including (but not limited to) the Mangaharakeke, Wharepapa, Mangahoanga, Tokiaminga, Wharekaunga, Kopuhurihuri, Mangakara and Mangamingi sub-catchments (see Map 2 and Map 6).
- Elevated dome / hill landforms of Kairuru (447m asl), Pukekahu (345m asl.) and Deer Hill (317m asl) (see Map 2).
- Extensive pastoral landcover defined by typical grazing field sizes and associated windbreak vegetation dominant with very occasional small isolated patches of indigenous vegetation present (typically < 10ha) mostly associated with riparian reserve land (DoC) (see Map 7).
- Deciduous hardwoods that characterise the vegetation patterns of riparian areas particularly to the south including the south eastern reaches of the Waikato River (Hardcastle Lagoon).
- DoC reserve land includes areas identified as Waiotapu Stream Marginal Strips, Unnamed Local Purpose (Quarry) Reserve near Parekarangi, unnamed crown reserve land, Loop Road Stewardship area (13ha – geothermal pool). Torepatutahi Stream Marginal Strips (28 ha) and adjoining (upstream), Onepu/Rautawiri Streams Marginal Strip (Torepatutahi sub-catchment), Golden Springs geothermal reserve, and associated lowland created wetland in QEII covenant area (see Map 10).
- Waiotapu Golf Course (DoC Recreation Reserve).
- Unprotected indigenous landscape areas include Hardcastle Lagoon (57 ha wetland system) Rawhiti Lagoon (31ha wetland system), 80 ha of riparian indigenous vegetation on the lower Torepatutahi Stream, Wills Swamp (1ha).
- Broadlands, Parekarangi, and Golden Springs rural centre communities and isolated rural dwellings and farm buildings. Also includes dairy processing factory at Parekarangi.
- Areas identified of particular cultural landscape value (south western Waikato River)




Local Character Areas:

- Rural pasture land
- Rural community centres

Landscape Management Issues:

- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities. (e.g. Environmental Farm Plans; Dairying Clean Streams Accord (MAF, MFE, Fonterra and Local Govt NZ); Guide to Managing Farm Dairy Effluent (Environment Waikato); Trees on Farms (Environment Waikato).
- Protection and management of wetland and riparian systems.
- Recognising identified cultural landscape values.
- Riparian management and appropriate management of geothermal resources.

11.4

Reporoa Township

0 0.25 0.5 km

1:5,000 Aerial Source: Rotorua District Council: 2001, 2006.

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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11.0 REPOROA

Landscape Character Area 11.4: Reporoa Township

Area Defined by:

- Birch Road to the north.
- Waiotapu Stream to the west
- Wharekaunga Stream to the south
- Pasture land west of Longview Road to the east.

Area Characterised by:

- Rural township settlement patterns (Rural D zone) including rural centre commercial and community services and Reporoa College (see Map 2 and Map 11).
- Flat terrain (see Map 4).
- Simple block rural sub-urban subdivision patterns (Broadlands Road, Massey Road, Reporoa Road).
- Rural amenity landscape and streetscape values.
- Local purpose reserves (See Map 11).

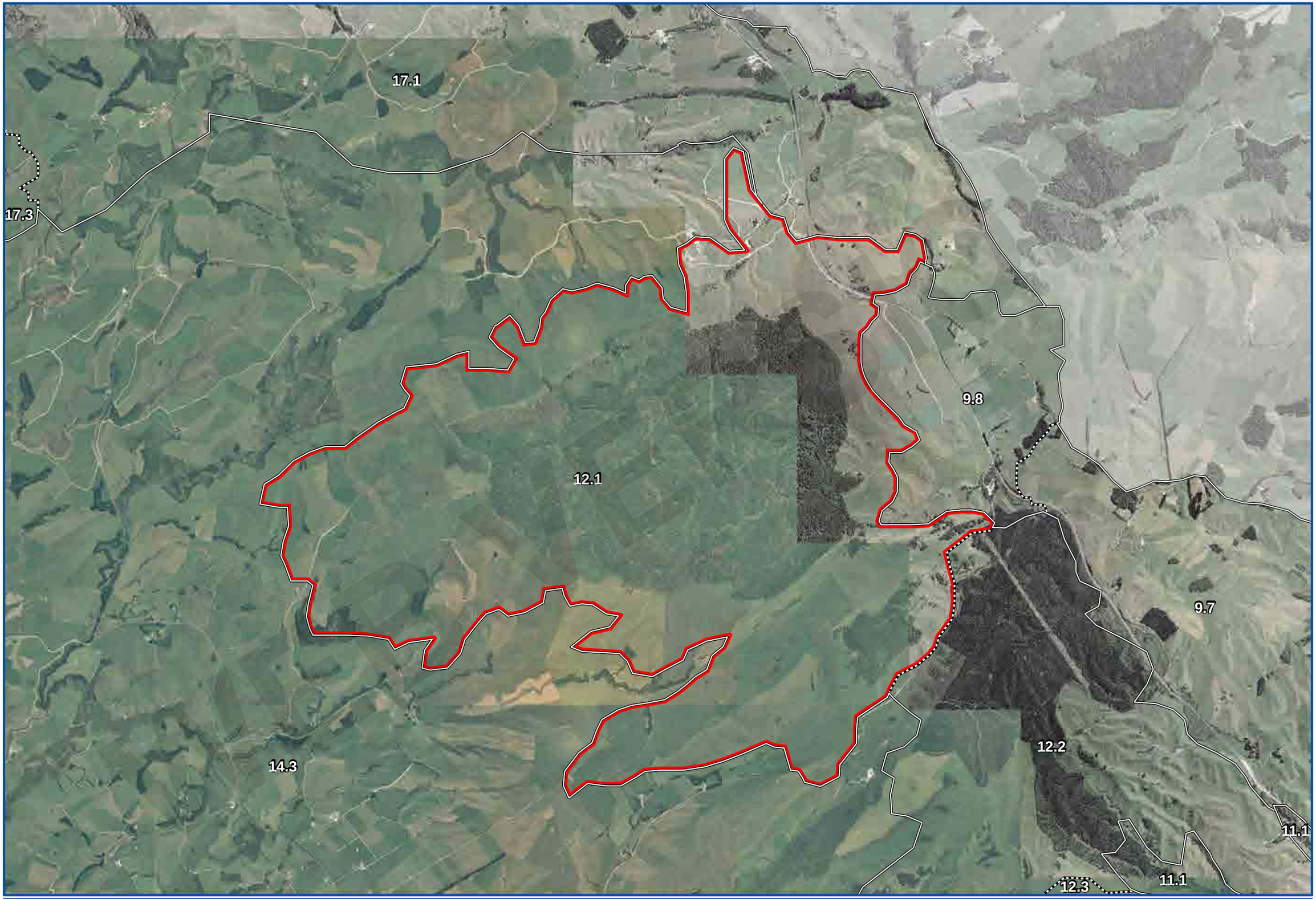
Local Character Areas:

- Reporoa Commercial and Community Centre
- Reporoa Rural Sub-Urban

Landscape Management Issues:

- Provision of reserves / open space and linkages.
- Maintenance and provision of community facilities.
- Integrated stormwater management and drainage.

12.1



Tumunui Hill

0 0.5 1 km

1:30,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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12.0 PAEROA UPLANDS

Landscape Character Area 12.1: Tumunui Hill

Area Defined by:

- Upper sub-catchment areas of the Rotohouhou and Karapiti Stream systems to the north.
- Corbett Road hill country to the west.
- Upper sub-catchments of the Whirinaki Stream system to the south.
- Earthquake flats to the east.

Area Characterised by:

- Volcanic upland landform derived from Rhyolite lava dome and associated foothill areas. Tumunui Hill (761m asl). Includes northern trig 8534 (712m asl) (see Map 2 and Map 4).
- Waikorapa hill to the south (696m asl).
- Tumunui Hill is identified as predominantly Class 6 land associated with steeply rolling dome hill country with steeper areas of Class 7 land on the northern hill scarps. Waikorapa Hill is identified as Class 7 land representative of generally more dissected and steeper ridge hill landform and associated scarp features (see Map 8).
- Landcover characterised by 545 ha of indigenous forest including areas of manuka / kanuka shrubland on upland dome (Identified as Tumunui Bush – NZMS 260). Potential ecological values particularly for native bird species and representative indigenous forest assemblages. Surrounding foothills and slopes in pasture (see Map 2 and Map 7).
- 28 ha of indigenous forest to the south (named as Waikite Farm Block Covenant (DoC) including the Waikorapa Bush on Waikorapa Hill (surrounding foothills and slopes in pasture.)
- Drainage patterns include first order upper sub-catchment gullies of the Whirinaki Stream and Rotohouhou and Karapiti Stream systems that drain to the west (see Map 6).
- Both Tumunui and Waikorapa are identified as upland features of cultural significance (see Map 12).
- Predominantly Maori land holdings.

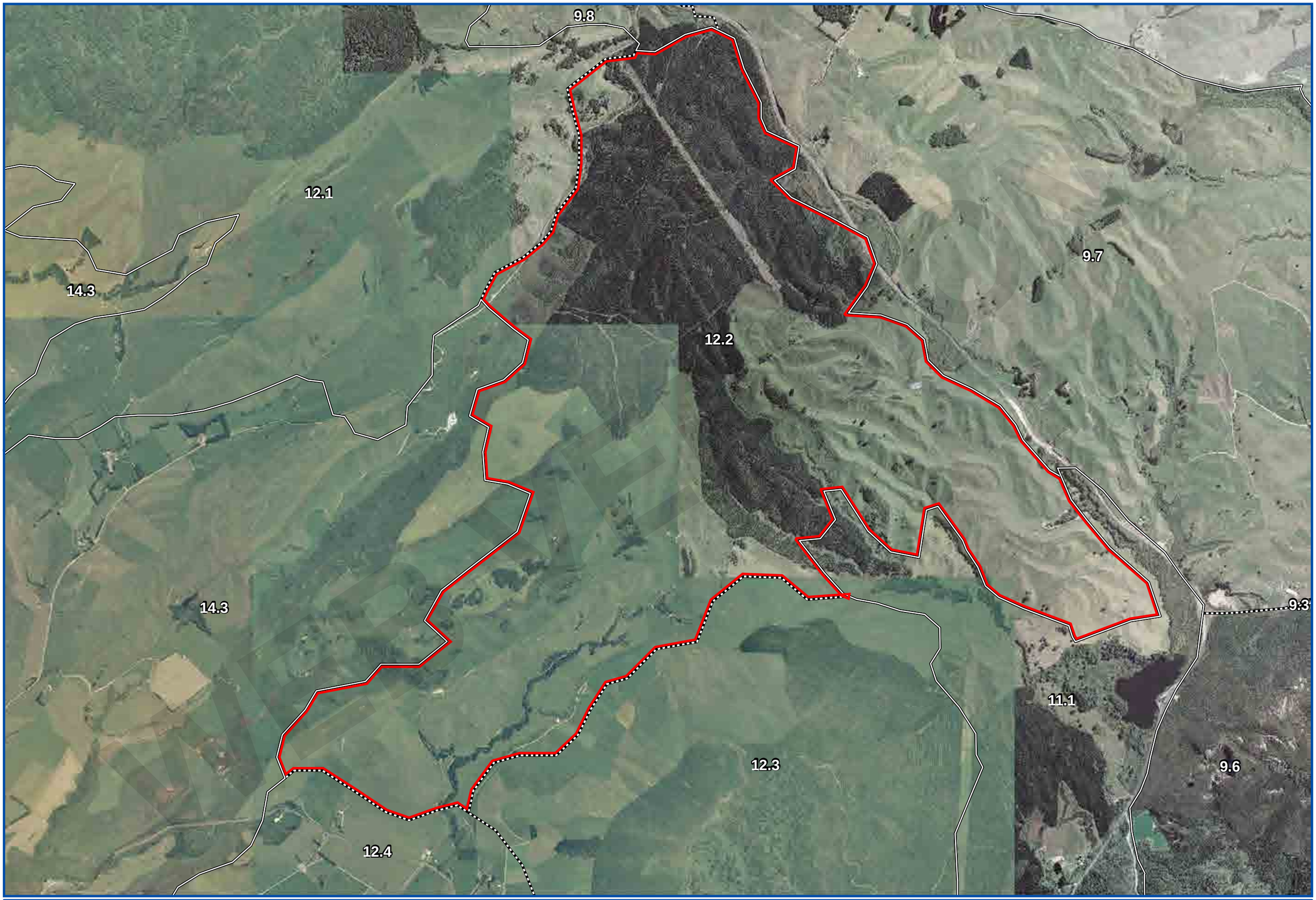
Local Character Areas:

- Tumunui
- Waikorapa

Landscape Management Issues:

- The protection, management and enhancement of contiguous areas of indigenous vegetation.
- Recognition of landscape features of cultural significance.

12.2



Tutehu Hills

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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12.0 PAEROA UPLANDS

Landscape Character Area 12.2: Tutehu Hills

Area Defined by:

- Earthquake flats in the north.
- Waikorapa Hill and Puakohurea / Waikiti Springs in the west.
- Maungaongaonga in the south.
- Waimangu South hill country in the east.

Area Characterised by:

- Harder volcanic parent material in the west of moderate slope (flat to undulating) with more unconsolidated older breccia material to the east resulting in more dissected and varied ridge and gully terrain (strongly rolling to steep with very steep gully scarps – 26 degrees plus). Older breccia grassed and forested slopes generally stable when <20 degrees (see Map 5).
- Class 6 land dominates with some areas of Class 7 land. Both Classes identified as containing erosion prone sub-classes (see Map 8).
- Geopreservation features identified include active earth deformation features (faults) (see Map 9).
- Pasture landcover predominates in the south with both low producing and high producing exotic grassland and some isolated and fragmented indigenous vegetation patches on steeper gully slopes.
- Indigenous forestry patterns also include part of DoC Stewardship area that extends to the southwest to include Puakohurea / Waikiti Springs complex (see Map 10).
- Production forestry landcover in the north. Includes a cleared bush area (44ha) previously identified as Hakareteke Stream Bush.
- Drainage patterns include upper sub-catchments of the Hakareteke Stream complex that drains south east to the Waiotapu Stream system, first and second order drainage gullies associated with Lake Tutaeinanga to the southwest, and first order streams associated with the Puakohurea / Waikiti Springs complex in the southwest (see Map 6).

Local Character Areas:

- Northern Forestry
- Southern Pastureland

Landscape Management Issues:

- Management of rural land use activities on marginal land in regard to erosion susceptibility.
- Protection and enhancement of existing isolated patches of indigenous vegetation.

12.3

Maungaongaonga

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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12.0 PAEROA UPLANDS

Landscape Character Area 12.3: Maungaongaonga

Area Defined by:

- Tutehu Hills to the north (Landscape Character area 12.2).
- Hakareteke Stream system and Lake Ngahewa to the east.
- Waiotapu Geothermal area to the south.
- Waikite Valley Road between Waiotapu and Ngapouri Road in the west.

Area Characterised by:

- Elevated Dacite lava dome comprising a main dome and a little-eroded lava mound occupying a breached central crater (825m asl). Identified as a geopreservation site (see Map 9 and Map 4)).
- Geothermal activity apparent on southern lower slopes directly south of summit near Waikite Valley Road (steaming ground).
- Class 6 and 7 land predominates with moderately steep to very steep terrain predominating over upper elevations easing to strongly rolling to rolling slopes in the west and south below 500m asl (approximately) (see Map 8).
- Landcover includes 112 ha of broadleaved indigenous hardwoods and approximately 6 ha of manuka / kanuka shrubland on the south eastern slopes and an extensive area of plantation forestry on the steep eastern flanks. Upper western flanks are also covered in plantation forestry (see Map 7).
- Both indigenous vegetation areas and upper western pine forest flanks are identified as being within the Maungaongaonga Scenic Reserve (DoC).
- Western slopes drain to Lake Ngapouri and Lake Tutaeinanga complex to the southwest. Eastern and southern slopes drain to Waiotapu and Hakareteke Stream systems to the south east (see Map 6).
- Cultural landscape features including Maungaongaonga, Ngapouri and Tutaeinanga. Lakes Tutaeinanga and Ngapouri have been vested in Te Arawa Lakes Trust (see Map 12).

Local Character Areas:

- Upper Forest Lands (indigenous and exotic) Pastured Lower Slopes
- Eastern Exotic Forest Slopes

Landscape Management Issues:

- Management of visually prominent landform and Scenic Reserve land, in particular the strengthening of patterns of indigenous vegetation in relation to the upper western pine forest slopes.
- Management of future forestry harvesting regimes on steep visually prominent eastern flanks and industry best practice regarding sediment control and water quality in relation to Waiotapu Geothermal areas and associated stream systems and lakes.
- Management of pasture run off / nitrification issues regarding unvegetated pastoral gullies that drain to Lake Ngapouri and Lake Tutaeinanga.

12.4

Lake Ngapouri Basin

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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12.0 PAEROA UPLANDS

Landscape Character Area 12.4: Lake Ngapouri Basin

Area Defined by:

- Maungaongaonga to the north
- North western Paeroa Range scarps the west.
- Ngapouri Hills to the south and east.

Area Characterised by:

- Contained and elevated upland basin defined by surrounding harder volcanic parent material and characterised by unconsolidated and older alluvium parent materials. With a small volcanic dome intrusion evident (see Map 4 and Map 5).
- Class 3 land dominant with flat to undulating slope with some steep to very steep Class 6 land associated with isolated dome feature (see Map 8).
- Landcover dominated by pasture with one small isolated indigenous forest patch identified (<2ha). Limited areas of herbaceous freshwater vegetation also present in association with lake margins and riparian marginal strips and wetlands. Lake Ngapouri margin includes Lake Ngapouri Marginal Strip (DoC) reserve land (see Map 7).
- Drainage patterns characterised by Lake Ngapouri and Lake Tutaeinanga systems that drain to the wider Waiotapu system via the Te Kapakapa Stream to the south east with the south western basin (south of the dome feature) drains south through the Ngapouri Hills via the Kawaunui Stream system (see Map 6).
- Includes the Ngapouri Road and Waikite Road corridors with isolated rural dwellings and associated farm buildings and recent residential development on northern Lake Ngapouri margins.
- Some quarrying activity evident in association with adjoining Ngapouri Hill slopes.

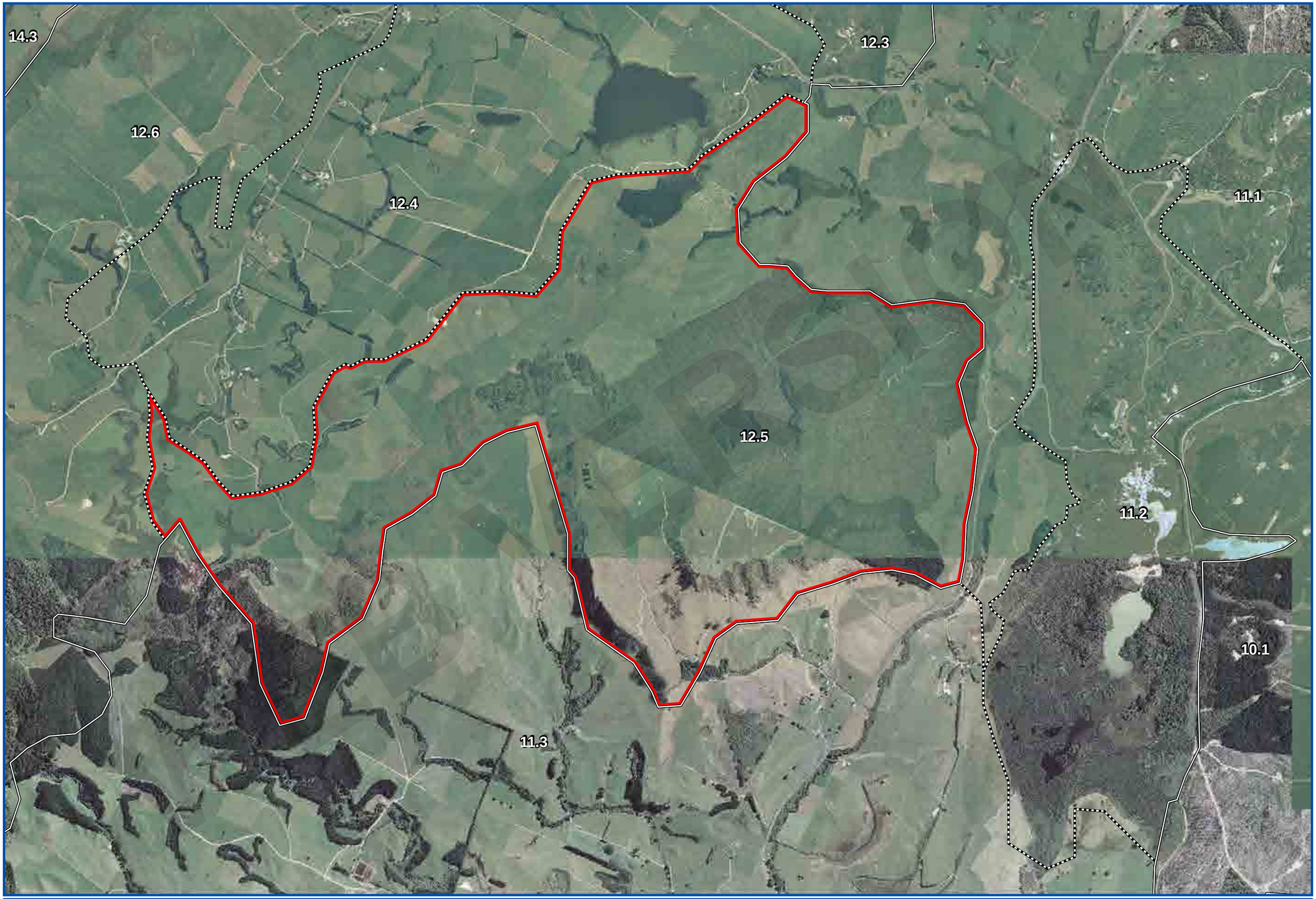
Local Character Areas:

- Lakeside Margins
- Rural Basin
- Elevated Dome Feature

Landscape Management Issues:

- Scale, location, siting and cladding, and colour of residential development on lakeside margins.
- Integration of rural residential development in association with the protection, strengthening and enhancement of natural patterns and processes.
- Scenic protection and amenity landscape considerations in relation to rural and rural residential development.
- Management of rural land use activities in relation to water quality of adjoining lake water bodies.

12.5



Ngapouri Hills

0 0.5 1 km

1:20,000 Aerial Source: Rotorua District Council: 2001, 2006.

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
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12.0 PAEROA UPLANDS

Landscape Character Area 12.5: Ngapouri Hills

Area Defined by:

- Te Kapakapa Stream catchments to the north.
- Lake Ngapouri basin to the west.
- Reporoa Valley to the south.
- Waiotapu to the east.

Area Characterised by:

- Hill and ridgeline hill series characterised by underlying geology of harder volcanic material contrasting with surrounding softer unconsolidated material and associated lower elevation landforms (see Map 4 and Map 5).
- Steep to very steep hill slopes / scarps (Class 7 dominant) easing to more moderately sloping rolling to undulating terrain on hill / dome summits (Class 6 land). Includes erosion susceptibility sub-classes (see Map 8).
- North east to south west aligned hill / ridge series from Hill 8561 (675m asl), Hill 8587 (620m asl) to an unnamed summit 548m asl in the south west (see Map 2).
- Hill series adjoins Hill 8566 (592m asl) to the east, a more prominent and singular elevated dome landform particularly in relation to SH 5 corridor.
- Drainage patterns characterised by Te Kapakapa Stream catchments that drain the hill series and Hill 8566 divide and the south draining upper catchments of the Awaroa and Kawaunui Stream corridors (see Map 6).
- Landcover dominated by pasture with the eastern slopes of Hill 8566 dominated by production forestry. Limited areas of indigenous vegetation are associated with the very steep Class 7 land on the southern scarp areas (see Map 7).

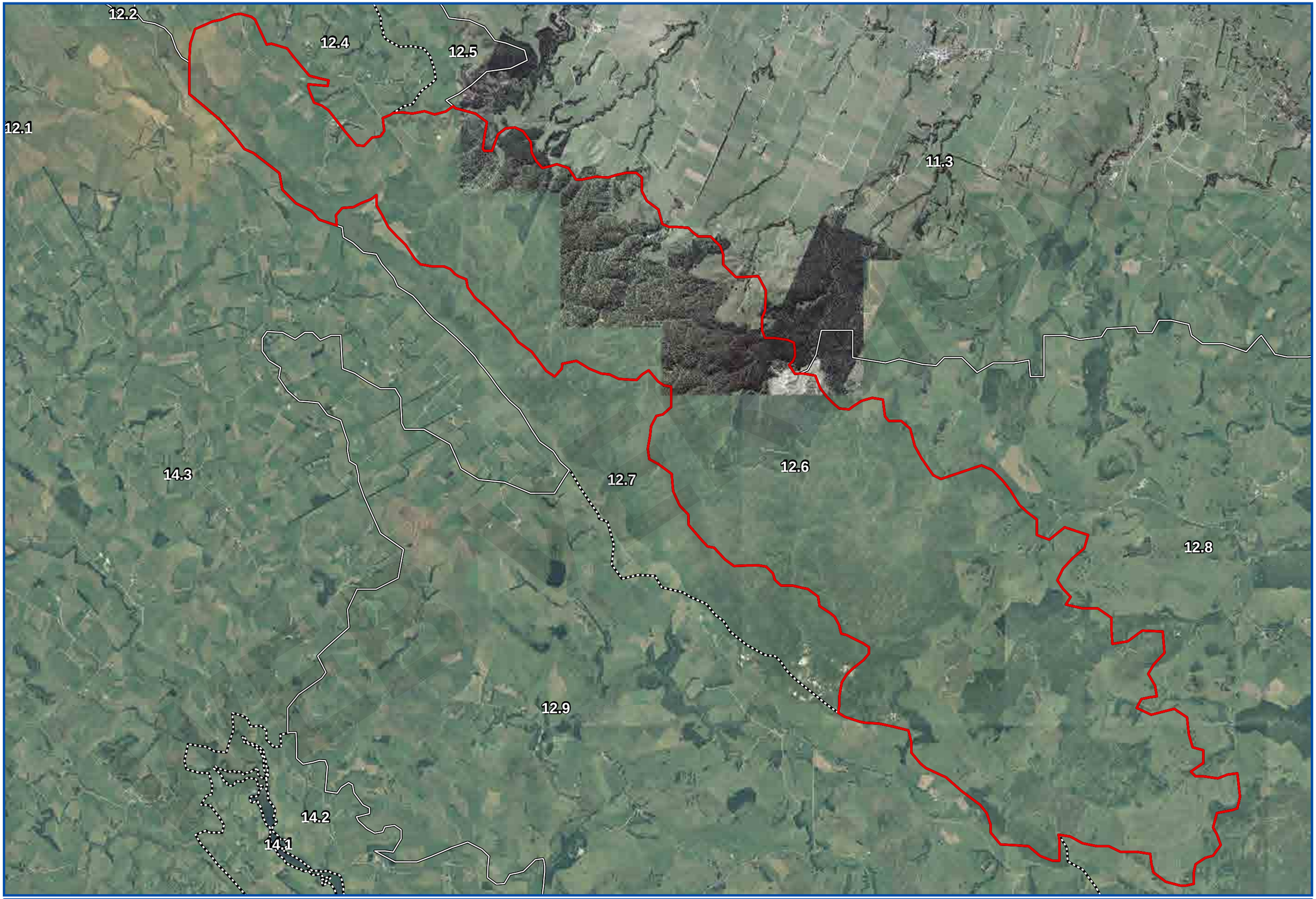
Local Character Areas:

- Hill 8566
- NE – SW Hill / Ridge Series

Landscape Management Issues:

- Management of amenity landscape resource and scenic landscape qualities of Hill 8566 in relation to forestry harvesting rotations within a working rural landscape
- Integration of the above with soil and water quality best practice particularly in relation to adjoining Waiotapu Geothermal area.
- Recognition of forestry best practice in relation to rural land use actives on steep erosion prone slopes (New Zealand Forest Owners Association - Environmental Research Database).

12.6



Central Paeroa Range

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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12.0 PAEROA UPLANDS

Landscape Character Area 12.6: Central Paeroa Range

Area Defined by:

- Ngapouri basin to the north.
- Paeroa Range western scarps to the west and southern Te Kopia Road to the south west.
- Paeroa Range Southern foothills (generally below 500m) to the south.
- Reporoa Valley to the east.

Area Characterised by:

- Three distinct underlying geologies (see Map 5) -
    1) more elevated and steeply dissected terrain of the Kawaunui and Wharepapa upper catchment areas in the north reflecting a harder volcanic parent material,
    2) less steeply dissected upper sub-catchment basin of the Mangahoanga Stream derived from an area of unconsolidated older breccia material, and
    3) the broken hill country of a distinct area of massive siltstone / sandstone in the south (near Pukemoremore Road) associated with the upper sub-catchments of the Purukohukohu, Whakapanake and Wharekaka Streams.
- Class 7 and 6 land dominates with little undulating, rolling or flat land. Steepness limitations evident in upper incised drainage gullies and in southern broken hill country (see Map 8).
- Indigenous landcover predominates including portions of the Te Kopia Scenic Reserve (DoC) with limited areas of pasture in the north and areas of intermixed production forestry and pasture in the south. This southern area also includes an area of approximately 78ha of indigenous forest near Te Waro Hill identified as Mangamingi Station Bush (see Map 7 and Map 10).
- Individual summit features of cultural significance (see Map 12).

Local Character Areas:

- Northern Dissected Uplands
- Southern Broken Hill Country

Landscape Management Issues:

- Management of Scenic Reserve land.
- Management of significant areas of unprotected indigenous vegetation contiguous with DoC reserve land.
- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities.
- Management of landscape features of cultural significance.

12.7

Paeroa Range Western Scarps

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
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12.0 PAEROA UPLANDS

Landscape Character Area 12.7: Paeroa Range Western Scarps

Area Defined by:

- Northern Paeroa Hills to the north (including Hill 8533).
- Te Kopia Road and the Waione and Te Waro Stream valley pasture land to the west.
- Southern Paeroa Range foothills in the south.
- Paeroa Range ridgeline and east facing Paeroa Range slopes in the east.

Area Characterised by:

- Steep to very steep prominent volcanic range and west facing scarps. Includes rocky outcrops and bluffs. Includes Paeroa summit (979m asl) (see Map 7).
- Areas of broadleaf indigenous hardwood landcover and unspecified indigenous forest identified as well as small unique area of sub-alpine shrubland (see Map 7).
- Includes active geothermal areas and features including small (2000m2 -200m2) lakes and pools in the south (see Map 9).
- Includes Te Kopia Scenic Reserve, including ecologically significant forest assemblages particularly in association with geothermal areas and a smaller stewardship area associated with geothermal features (see Map 10).
- Upper catchment areas of the west draining Mangatete Stream system that drains to Lake Ohakuri in the north west.
- Includes individual summit features of cultural significance (see Map 12).
- Occasional small patches of wilding pine.

Local Character Areas:

- Upland Scarps
- Southern Geothermal Areas

Landscape Management Issues:

- Protection and management of indigenous vegetation.
- Management of scenic and recreational and geothermal resources in relation to public access.
- Stock exclusion on western pastoral edge.
- Management of landscape features of cultural significance.

12.8

16.2

14.2

12.7

12.9

14.1

12.6

14.2

11.3

12.8

13.1

13.2

13.1

Southern Paeroa Foothills

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA

ROTORUA DISTRICT COUNCIL

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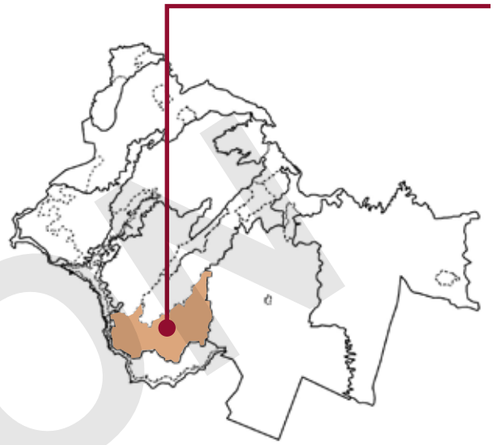
12.0 PAEROA UPLANDS

Landscape Character Area 12.8: Southern Paeroa Foothills



Area Defined by:

- Central Paeroa Range to the north
- North-western foothills to the west.
- Waikato River northern bank and slopes to the south.
- Reporoa Valley to the east.

Area Characterised by:

- Distinct broken hill country derived from siltstone / sandstone massive geology.
- Class 6 and 7 land dominates with steep to very steep terrain associated with individual hill features particularly in the east including Pukemoremore (632m asl), Pukepapataringa (609m asl) Hill 85812 (555m asl), Hill 1133 (565m asl) and in the west, the less distinct and more dissected hill country characterised by Hill 8589 (501m asl) and Hill 8588 (571m asl) (see Map 8, Map 2 and Map 4).
- Undulating to rolling hill terrain in the south west that eases from broken western hills.
- The Akatarewa, Waitakahi and Wharekaka Stream upper and mid sub-catchment areas that drain west and southwest to the Waikato River and Lake Ohakuri and the east draining sub-catchments of the Purukohukohu and Whakapanake Streams that drain to the Waiotapu System and the Waikato River (see Map 6).
- Individual summit features of cultural significance (see Map 12).
- Pastoral land cover predominates in the east and on the south western undulating hill terrain with areas of production forestry being more characteristic of landcover in the west. Occasional, isolated and fragmented areas of indigenous vegetation present in association with riparian areas as well as steep slopes of individual hill features See Map 7).

Local Character Areas:

- Eastern Hills and Summits
- Western Forestry
- Western Undulating Pastoral Hills

Landscape Management Issues:

- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities.
- Recognition of scenic and amenity values of individual summit / hill features in relation to rural land use activities and the protection and enhancement of those values.
- Management of landscape features of cultural significance.

12.9

North-Western Paeroa Foothills (Puaiti/Te Weta)

0 0.5 1 km

1:50,000 Aerial Source: Rotorua District Council: 2001, 2006.

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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12.0 PAEROA UPLANDS

Landscape Character Area 12.9: North-Western Paeroa Foothills (Puaiti / Te Weta)

Area Defined by:

- Waikite Valley Road in the north.
- Upper Lake Ohakuri in the west and southwest.
- Northern areas of the Akatarewa Stream corridor in the south.
- Upper Mangatete Stream Valley and Te Kopia Road in the east.

Area Characterised by:

- Harder volcanic underlying geology south of Mangatete Stream reflected in predominantly Class 6 and 7 land characterised by steep to very steep northeast to southwest aligned ridge series landforms defined by surrounding rolling to undulating terrain. Includes named summit Puaiti (649m asl) and associated hills. Includes the flatlands of the contained upper Mangatete Valley (see Map 5 and Map 4)
- Varied underlying geology north of Mangatete Stream with a variety of both unconsolidated and harder volcanic parent material reflected in similar yet more broken ridgeline landforms with steep to very steep hill scarps and a greater prevalence of flat to undulating terrace and valley terrain (for example, Te Weta Road). Includes named summit Te Weta (627m asl) (see Map 2 and Map 4).
- Principal drainage patterns of the Mangatete system that drain to Lake Ohakuri to the west. Also includes Fraser and Hotupuku Streams and several unnamed systems that also drain to the west and southwest to Lake Ohakuri (see Map 6).
- Predominantly in pasture landcover with few small (<15ha) isolated and fragmented patches of indigenous landcover north of Mangatete Stream with two larger patches to the south. One of these larger patches is the Puaiti Bush Scenic Reserve (54ha- DoC) and part of the contiguous area of bush associated with the eastern shore of Lake Ohakuri, west of Dods Road and the steep south facing slopes of Hill 1131 (560m asl).
- Individual summit features of cultural significance (see Map 12).
- Rural farm dwellings and associated buildings.

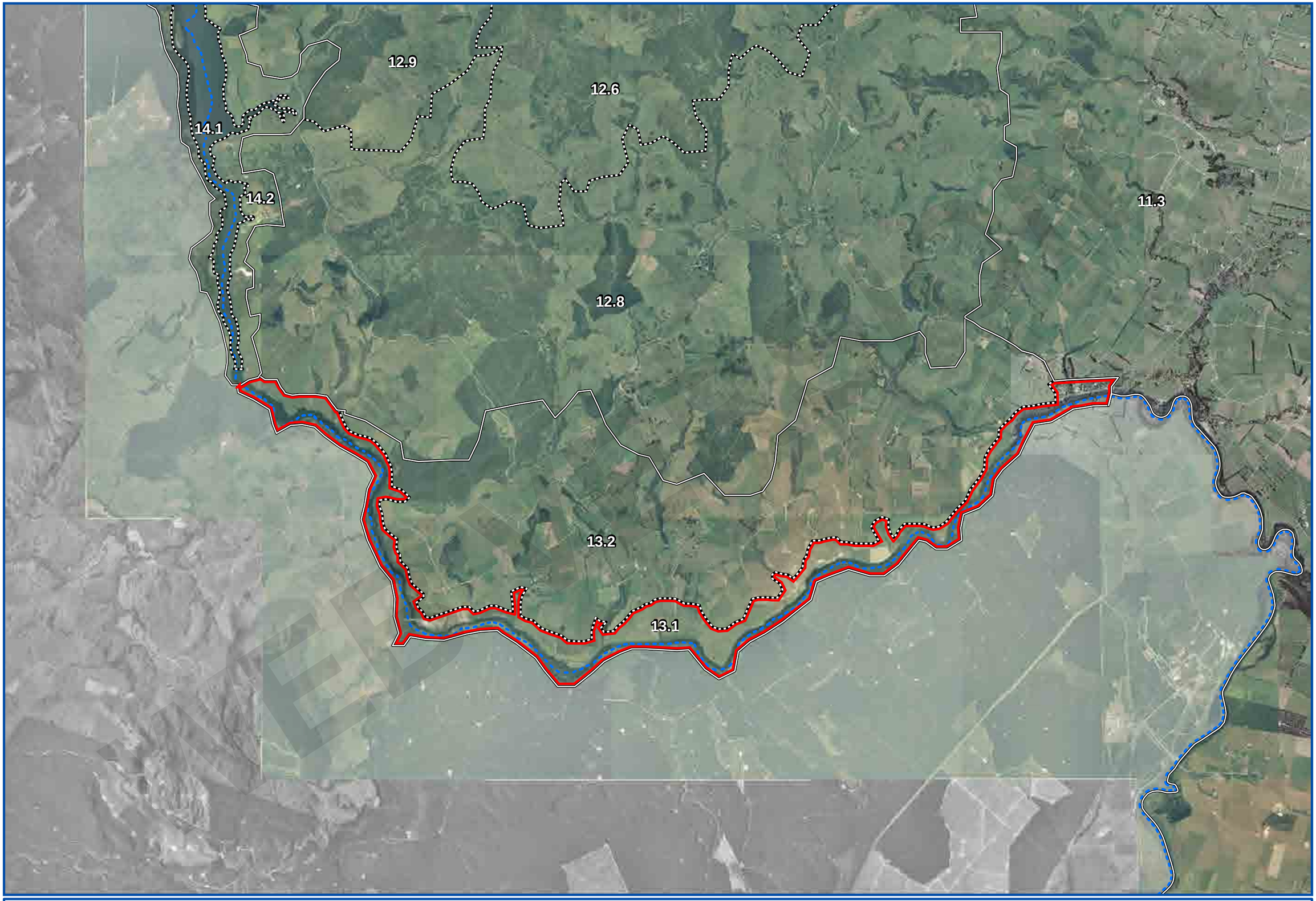
Local Character Areas:

- North of Mangatete Stream
- South of Mangatete Stream

Landscape Management Issues:

- Management of landscape features of cultural significance.
- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities.

13.1



Waikato River

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
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13.0 WAIKATO RIVER

Landscape Character Area 13.1: Waikato River Corridor

Area Defined by:

- Waikato River northern bank and foothills to the north.
- Lake Ohakuri to the west.
- District boundary with Taupo District Council in the south.
- Confluence of Waiotapu Stream and Waikato River in the east (Waimahana).

Area Characterised by:

- Waters and margins of the Waikato River
- Flat flood plain pasture land associated with unconsolidated tephra alluvium parent material east of Orakonui Stream with patches of unconsolidated to moderately consolidated material to the west (see Map 2, Map 4 and Map 5).
- Class 3 land gully erosion susceptible land predominates to the east with strongly rolling to very steep Class 6 and some very steep river scarp Class 7 land to the west (see Map 7).
- Pastoral land cover predominates in the east with occasional, small (<10ha) and fragmented areas of indigenous riparian vegetation and more contiguous areas of indigenous vegetation to the west including Wharekaka Stream Marginal Strip (part) and Waikato River Marginal Strips (DoC) (see Map 10).
- Mihi rural settlement in the east.
- Cultural landscape values and associations (see Map 12).
- Extensive river side and esplanade reserve areas - Rotorua District Council Reserve A zoned land (see Map 11).

Local Character Areas:

- Eastern River Margin North
- Western River Margin North

Landscape Management Issues:

- Protection and management of scenic, recreational and amenity landscape values in association with the Waikato River (Reserves A land) and Section 6a of the Resource Management Act in regard to the natural character of rivers and their margins.
- Consideration of a wider southern Lakes Reserves and Open Space Strategy inclusive of the Waikato River and Southern Lakes Landscape resource.
- Recognition and integrated management of cultural landscape values.
- Strengthening of appropriate patterns of vegetation within riparian margins for soil stability.

13.2

Waikato River Northern Bank

0 0.5 1 km

1:30,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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13.0 WAIKATO RIVER

Landscape Character Area 13.2: Waikato River Northern Bank

Area Defined by:

- Southern Paeroa Foothills to the north.
- Lake Ohakuri to the west.
- Waikato River margins to the south.
- Mangamingi Road to the east.

Area Characterised by:

- A variety of unconsolidated, Taupo and Kaharoa alluvial tephra and older tephra material that is distinct from the sandstone/siltstone massive to the north.
- Flat to gently rolling terrain that reflects the above underlying geology and identified as predominantly Class 3 and 4 land east of the Tutukau Road / Te Kopia Road junction moving to more broken and strongly rolling terrain to the west characterised by Class 6 and some limited areas of Class 7 land associated with very steep hill scarps (see Map 8).
- Pastoral land cover predominates with few small and isolated patches of indigenous forest with similarly limited areas of production forestry also evident (see Map 7).
- South draining catchments of the Paumauma, Te Awaiakonao, Whangairorohea and Whakapanake Streams (see Map 6).

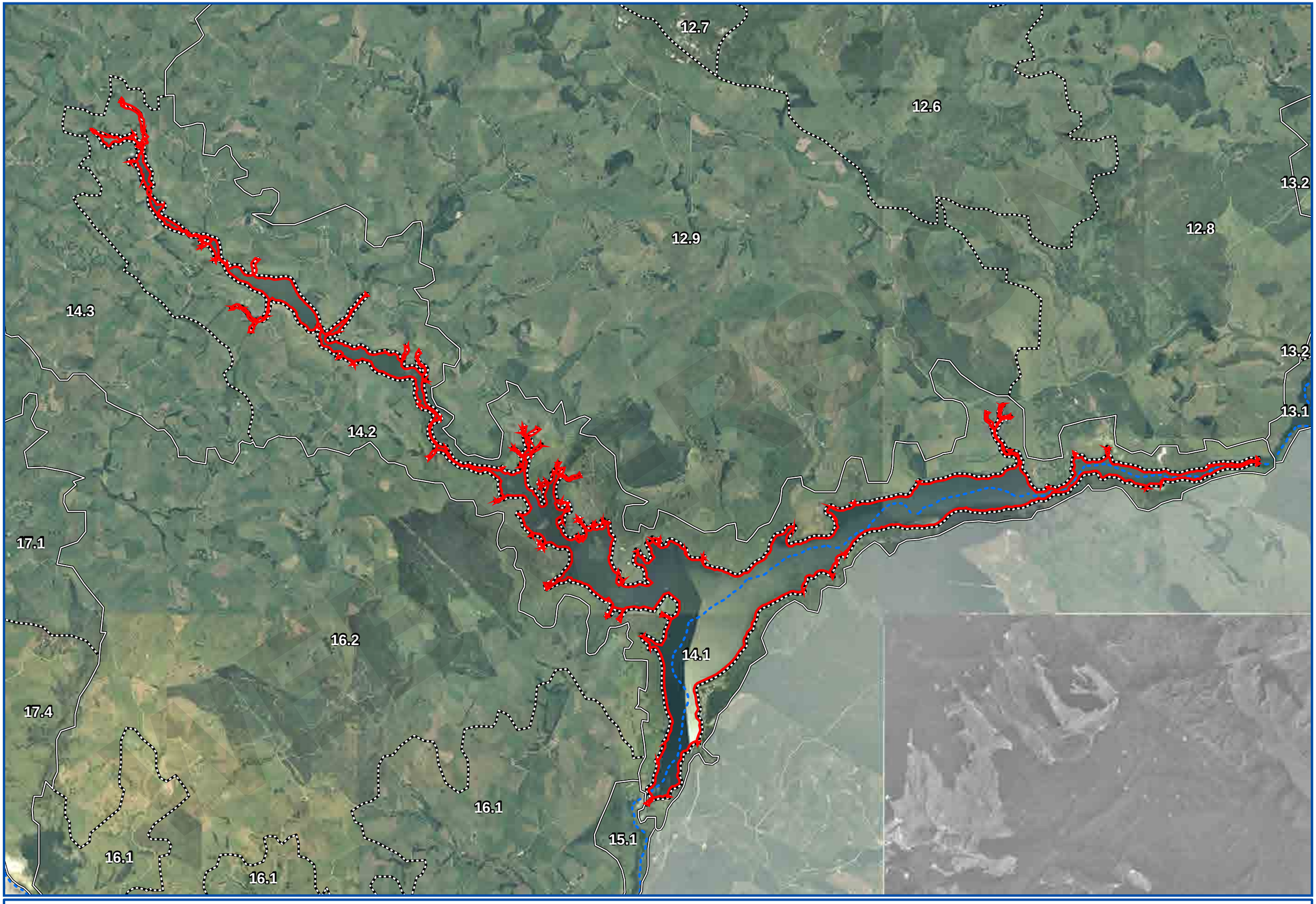
Local Character Areas:

- Eastern Undulating Flat Lands
- Western Broken Hills

Landscape Management Issues:

- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities. (e.g. Environment Waikato - River Management Guidelines).
- Strengthening of appropriate patterns of vegetation within riparian margins for soil stability.

14.1



Lake Ohakuri

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
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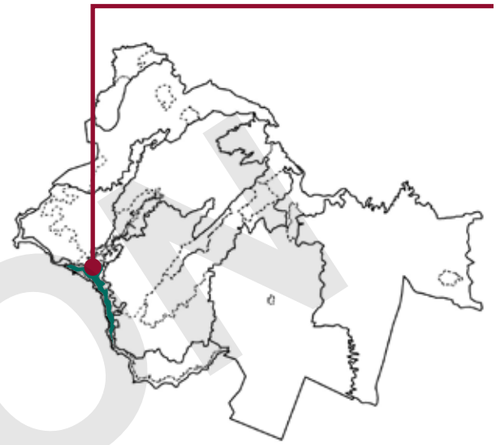
14.0 LAKE OHAKURI AND SURROUNDS

Landscape Character Area 14.1: Lake Ohakuri



Area Defined by:

- Waters of 938ha man made hydro lake within the Waikato River corridor and the Whirinaki Stream valley flooded up to the north of the Waikite Valley Road crossing.
- Ohakuri hydro dam and Lake Atiamuri in the west.
- Rotorua District boundary with Taupo District in the south.
- The Waikato River in the east.

Area Characterised by:

- Open lake waters.
- Contained flooded valley with two principal lake branches that reflect the alignment of the Waikato and Whirinaki drainage corridors and surrounding elevated topography (see Map 4 and Map 6).
- Indented and varied lake shoreline features including flooded sub-catchment gullies, gorges and embayments (see Map 2).
- Small lake islands and outcrops and associated wetland margins (see Map 3).
- Dam structure and infrastructure.
- Whirinaki Stream Marginal Strip (DoC) in extreme upper reaches of Whirinaki system.
- Receiving catchment of Whirinaki and Waikato drainage systems, as well as the principal west draining Mangatete, Fraser, Hotupuku and several unnamed streams. Several of these originate in the Ngapoipoiatore / Poutakataka hills to the northwest the south draining Totara Stream that originates within the hills northeast of Lake Ohakuri (see Map 6).

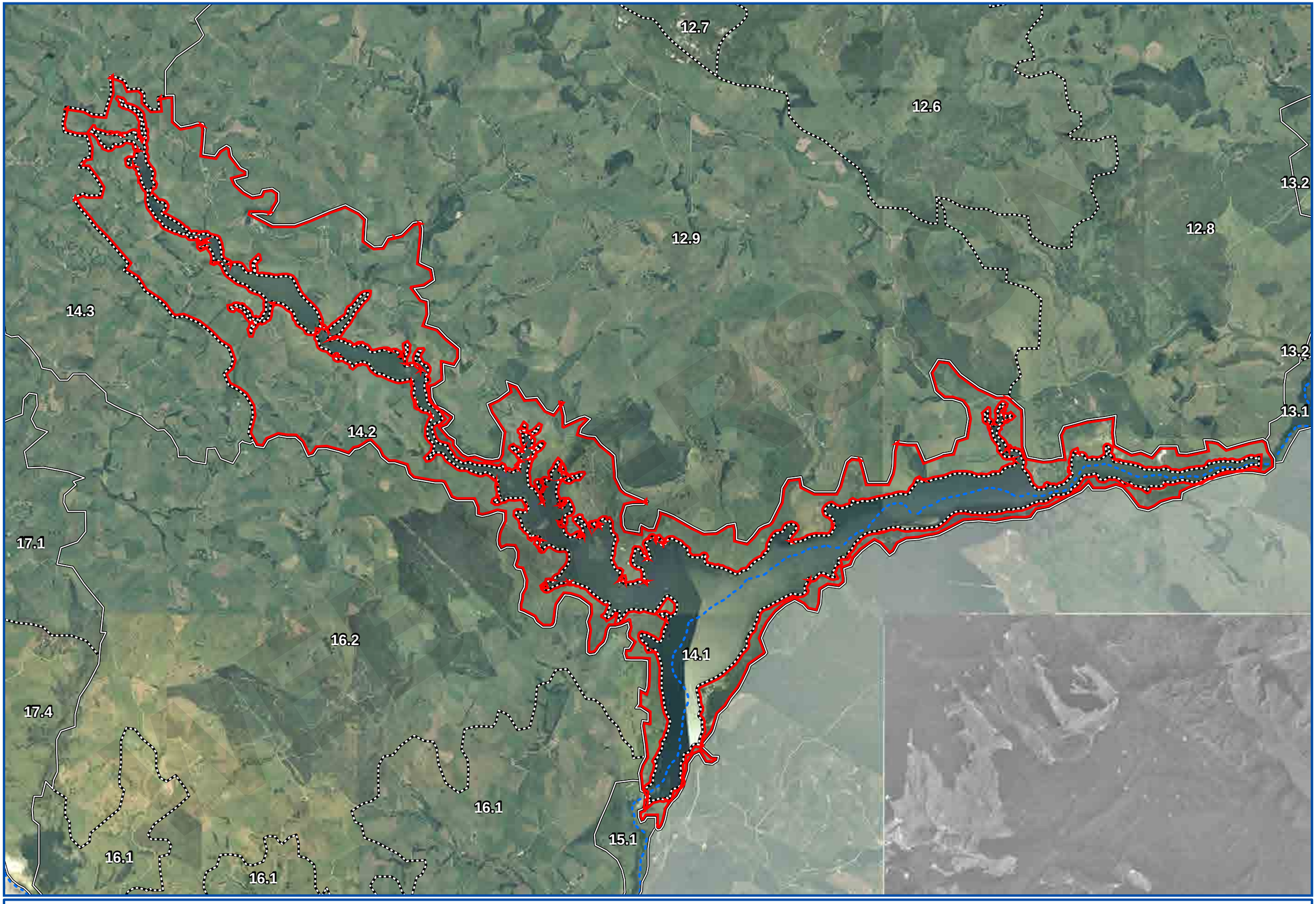
Local Character Areas:

- Upper Ohakuri (north of Whirinaki Valley Road)
- Lower Ohakuri (south of Whirinaki Valley Road)

Landscape Management Issues:

- Protection and management of scenic, recreational and amenity landscape values associated with the lake including lake access, on-water activities and associated facilities.

14.2



Lake Ohakuri and Whirinaki Valley

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
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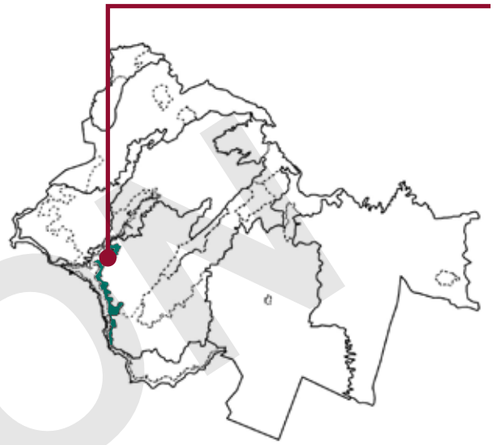
14.0 LAKE OHAKURI AND SURROUNDS

Landscape Character Area 14.2: Lake Ohakuri and Whirinaki Valley



Area Defined by:

- Whirinaki Basin to the north.
- Ngapoipoiatore / Poutakataka Hills to the west.
- Lake Ohakuri and the Rotorua District boundary with Taupo District Boundary to the south.
- North-western Paeroa Foothills to the east.
- Lake Ohakuri (internal boundary).

Area Characterised by:

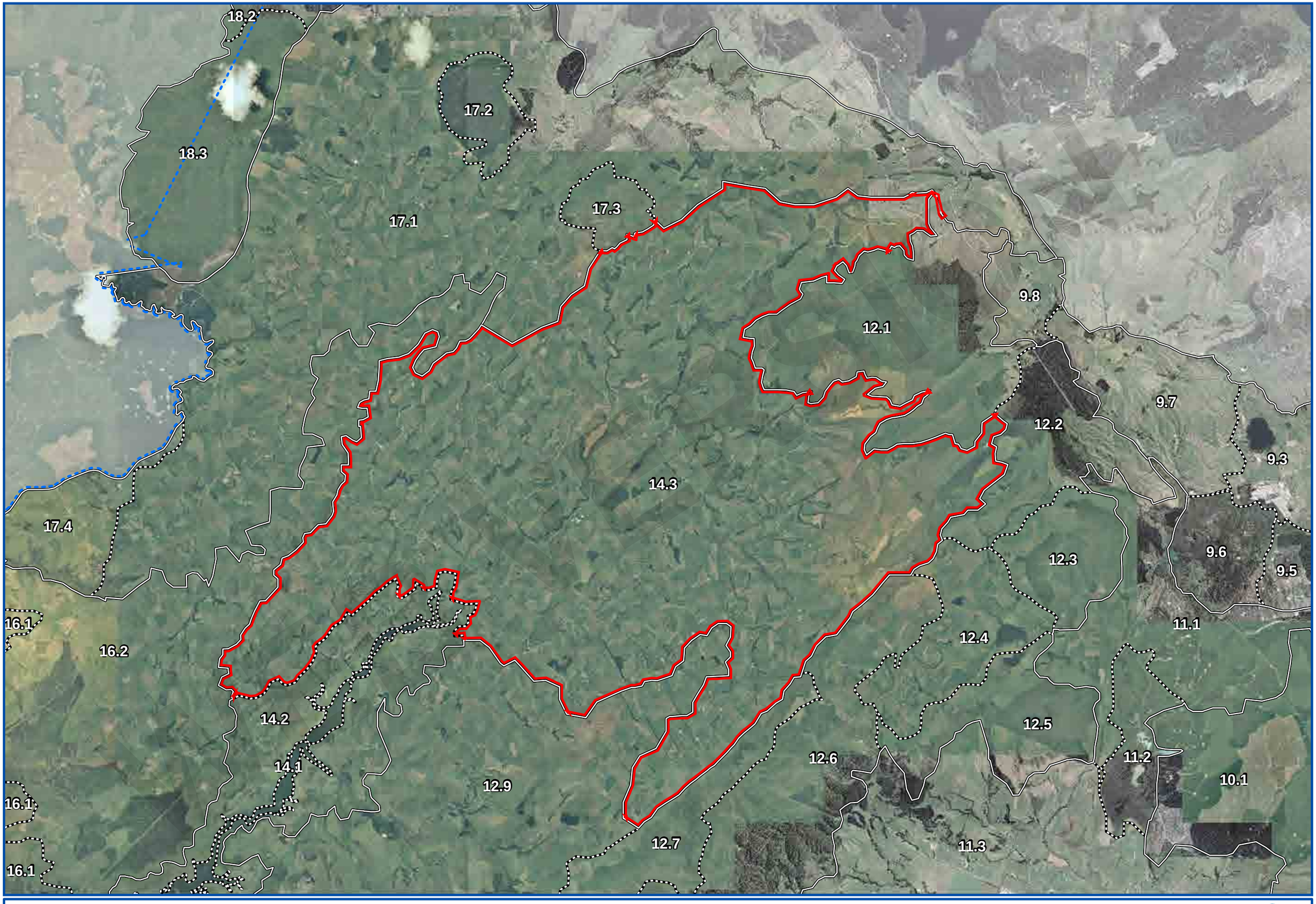
- A mix of alluvium tephra of differing ages to the north of the Whirinaki Road crossing reflected generally flat to undulating Class 3 terrain with some steeper terrace scarps also present (see Map 5).
- South of Whirinaki Road crossing underlying geology is characterised by more expansive areas of harder volcanic parent material resulting in steeper hill terrain features as well as areas of alluvium tephra within narrow lake sub-catchment valleys. Class 6 and 7 land predominates in steeper hill country with Class 3 in more moderately sloping alluvial valley floor areas (see Map 8).
- Landcover characterised by pasture to the north of Whirinaki Road crossing with indigenous land cover dominant to the south.
- Southern forested margins include extensive areas of Reserve A (public) zoned land on lake shores and margins including Whirinaki Stream marginal strip (18ha) and adjoining stewardship area (611ha), Mangamingi – Pukemoremore covenant (30ha) these areas contiguous with and similar to areas within the Waikato River corridor (see Map 11 and Map 10).
- Areas of unprotected indigenous vegetation including Te Kopia Swamp (50ha) and Orakei Korako Bush (148ha)
- Includes recreational and amenity landscape resources (Rotorua Sun Club accommodation / camping) west of Te Kopia Road near Lake Ohakuri shore and includes areas of potential ecological value.
- Geothermal features – silica terraces and hidden valley at Orakei Korako (see Map 3 and Map 9).

Local Character Areas:

- Upper Ohakuri (north of Whirinaki Valley Road)
- Lower Ohakuri (south of Whirinaki Valley Road)

Landscape Management Issues:

- Protection of significant areas of indigenous vegetation.
- Protection and management of scenic, recreational and amenity landscape values in association with the Waikato River (Reserves A land) and surrounds.
- Consideration of a wider Southern Lakes Reserves and Open Space Strategy to manage the Waikato River and Southern Lakes open space resources and the potential to integrate these with other wider recreational / landscape resources (e.g. Paeroa Range to the north).



Whirinaki Basin

0 0.5 1 km

1:75,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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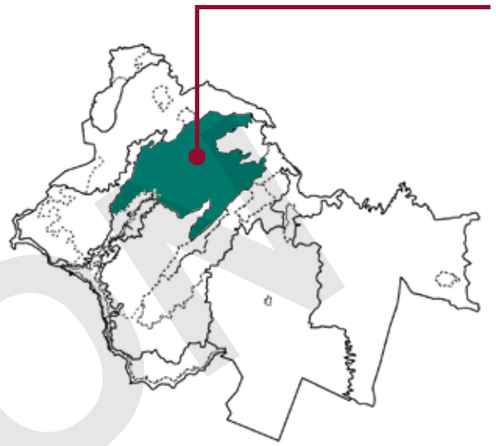
14.0 LAKE OHAKURI AND SURROUNDS

Landscape Character Area 14.3: Whirinaki Basin



Area Defined by:

- Tumunui Hill and Rotohouhou Stream corridor in the north.
- Poutakataka Hill series in the west.
- Whirinaki Valley to the south.
- Paeroa Range to the east.

Area Characterised by:

- A variety of underlying geology with Taupo / Kaharoa breccia featuring between Hossack Road and Corbett Road; Class 3 predominant reflected in flat to undulating terrain (see Map 5).
- Unconsolidated older breccias between Hossack Road and Mangatete Road north to Corbett Road, Class 6 and 4 dominant with associated broken rolling to strongly rolling terrain with some hill scarp areas of very steep terrain (see Map 8).
- Unconsolidated Taupo / Kaharoa breccia material between Mangatete Road and Poutakataka Road that includes the upper Whirinaki Valley with Class 3 and 4 characterised by undulating to rolling terrain predominating in proximity west of Mangatete Road to Whirinaki Valley Road.
- Older breccia material near upper Tumuni Road south to near Rehi Road, Class 3 and 4 dominate with rolling terrain moving to steeper more broken Class 6 and 7 land and associated strongly rolling terrain to the east.
- Pastoral landcover dominates with a number of isolated and fragmented areas of indigenous vegetation identified ranging from small (<5ha) to moderate (<60ha) in size. The majority of these bush areas are aligned with existing drainage patterns and steep gully corridors. None of the larger areas are identified as being of ecological significance despite potential ecological values representing other reserve areas (see Map 7).
- Recreational and public reserve land including the Waikite Valley Recreation Reserve, Waikite Government Purpose (Wildlife Management) Reserve, Waikite Thermal Pool Recreation Reserve, Unnamed Local Purpose (Quarry) Reserve (Corbett Road) Otamakokore Stream Marginal Strip (DoC), and Whirinaki Stream Marginal Strip (DoC) (see Map 10).
- Local rural roading network, the rural / community centre of Ngakuru and isolated rural farm dwellings and associated farm buildings with some limited new building evident.

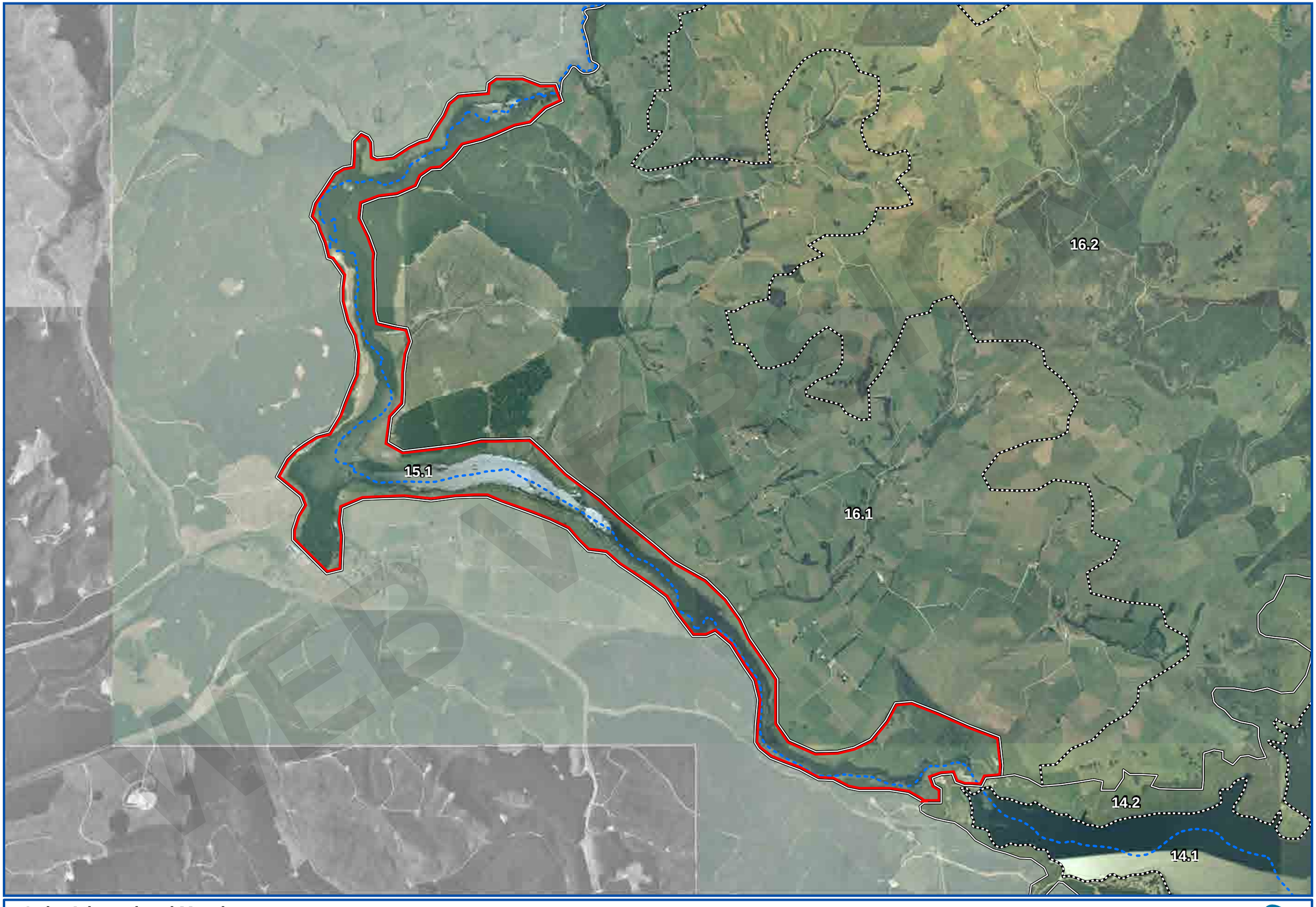
Local Character Areas:

- Rural Lowlands
- Rural Hills
- Geothermal Feature Areas

Landscape Management Issues:

- Management of existing areas of indigenous vegetation.
- Management of riparian areas and margins in association with the recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities. (e.g. Environment Waikato - River Management Guidelines, Clean Streams : A Water Body Enhancement Strategy for Environment Waikato; Environment Waikato Best Practice Guidelines for Waterways Crossings).
- Recognition of the existing and traditional Whirinaki rural landscape character and architectural scale and form in relation to the appropriate location, siting and cladding of new rural and rural residential dwellings.

15.1



Lake Atiamuri and Margins

0 0.5 1 km

1:30,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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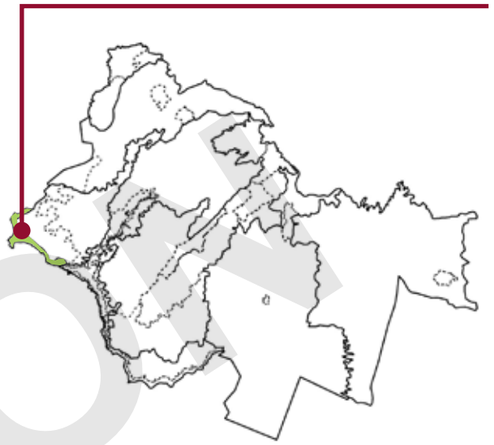
15.0 ATIAMURI

Landscape Character Area 15.1: Lake Atiamuri and Margins



Area Defined by:

- Whangapoa Stream and District boundary with South Waikato District to the north.
- Ngautuku summit and District boundary with South Waikato District to the west.
- District boundary with Taupo District Council to the south.
- Ohakuri to the east.

Area Characterised by:

- Open waters of 203ha man-made hydro lake (Atiamuri Hydro-electric Power Station).
- Flooded river valleys (Waikato River and lower Whangapoa Stream) between 200m and 300m in width within the northern and eastern reaches and up to 700m in width at its widest point where these two reaches meet (see Map 2).
- Surrounding lake margin geology (within the Rotorua District Boundary – i.e. northern lake shore) includes older ash and pumice material reflected in predominantly Class 3 land with areas of Class 4 land associated with minor south west draining tributary sub-catchment areas and associated underlying geology (harder volcanic to the east and softer tephra to the west) (see Map 5 and Map 8).
- Flat to undulating lake margin terrain rising to the toe of strongly rolling to steep lake side terrace slopes.
- Landcover characterised by production land uses principally forestry with some pastoral land use in the east (see Map 7).
- Receiving environment for numerous south and south west draining unnamed first to third order streams includes Aniwhaniwha Falls (see Map 6).
- Cultural landscape associations with Lake Atiamuri.

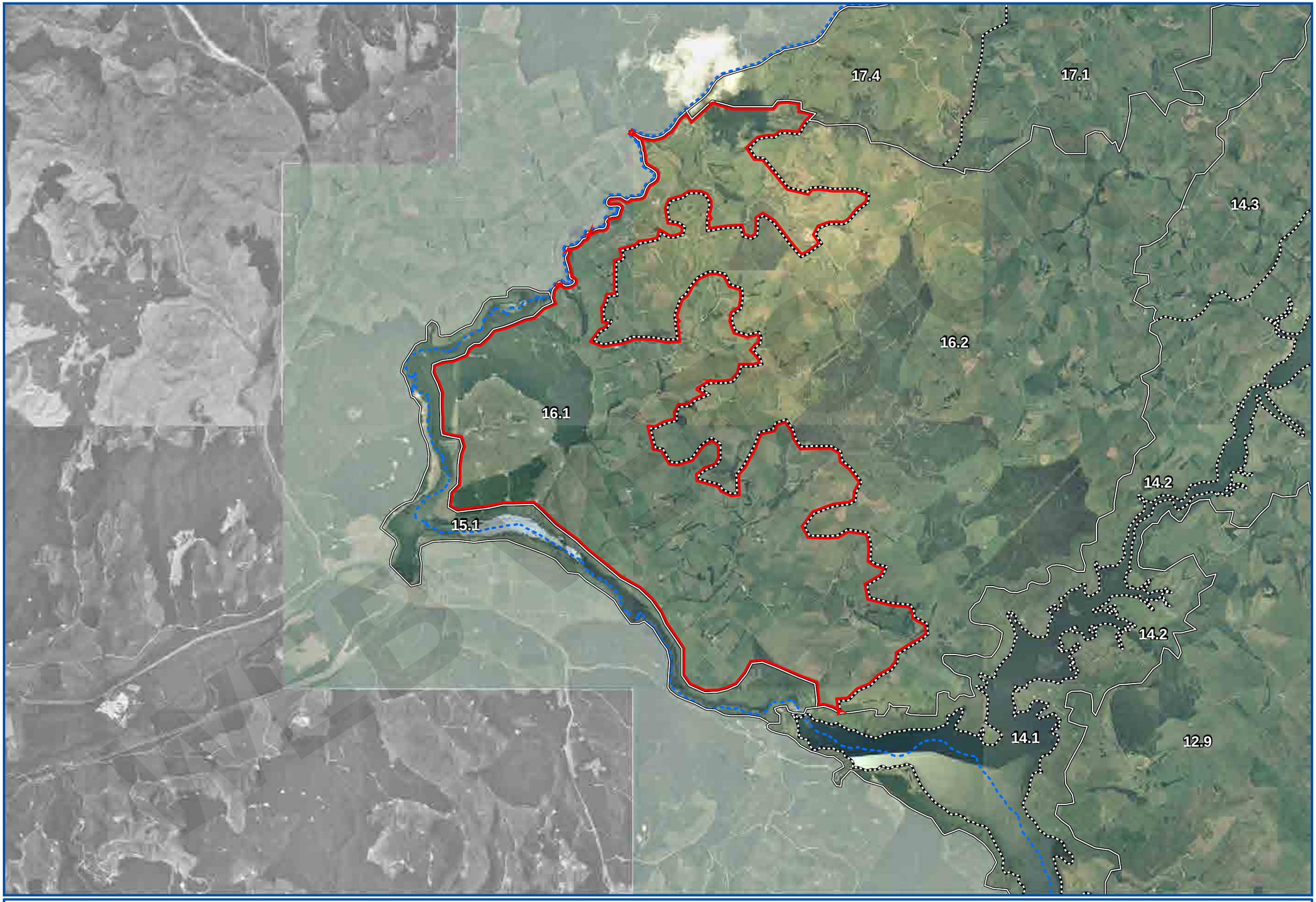
Local Character Areas:

- Northern Branch (forestry)
- Eastern Branch (pastoral)

Landscape Management Issues:

- Management of lakeside and riparian margin areas.
- Recognition of recreational and amenity landscape use and the integration with the management of scenic, recreational and amenity landscape values in association with the Waikato River (Reserves A land).
- Recognition of a wider Southern Lakes Reserves and Open Space Strategy inclusive of the Waikato River and Southern Lakes Landscape resource.
- Management of cultural landscapes and the potential integration of a wider Open Space Strategy.

16.1



Ohakuri Road Terraces

0 0.5 1 km

1:50,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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16.0 NGAPOIPOIATORE / POUTAKATAKA HILLS

Landscape Character Area 16.1: Ohakuri Road Terraces

Area Defined by:

- Whangapoa Stream and the upper northern reaches of the Lake Atiamuri.
- Rotorua District Boundary with South Waikato District and Lake Atiamuri to the west .
- Rotorua District Boundary with Taupo District and Lake Atiamuri to the south.
- Rising foothill slopes of Ngapoipoiatore to the east.

Area Characterised by:

- Underlying geology of predominantly older ash tephra deposits, with some areas of loosely consolidated alluvium parent material within principal drainage patterns particularly within the Matapan Road Valley (see Map 5 and Map 4).
- Class 3 and 4 erosion prone land predominates with principally flat to undulating terrain throughout (see Map 8).
- Areas of strongly rolling to steeper and some very steep terrain confined to alluvial terrace edge scarps.
- Landcover characterised by production forestry west of Ohakuri Road in various harvest rotations and pasture to the east of Ohakuri Road (see Map 7).
- Identified geopreservation area having hot springs with associated sinter deposits. (Some hot springs were submerged by the formation of Lake Atiamuri after the construction of the hydro-dam). Includes Upper Atiamuri Geothermal Scientific Reserve (DoC) (see Map 10).
- Upland hill features of cultural significance.

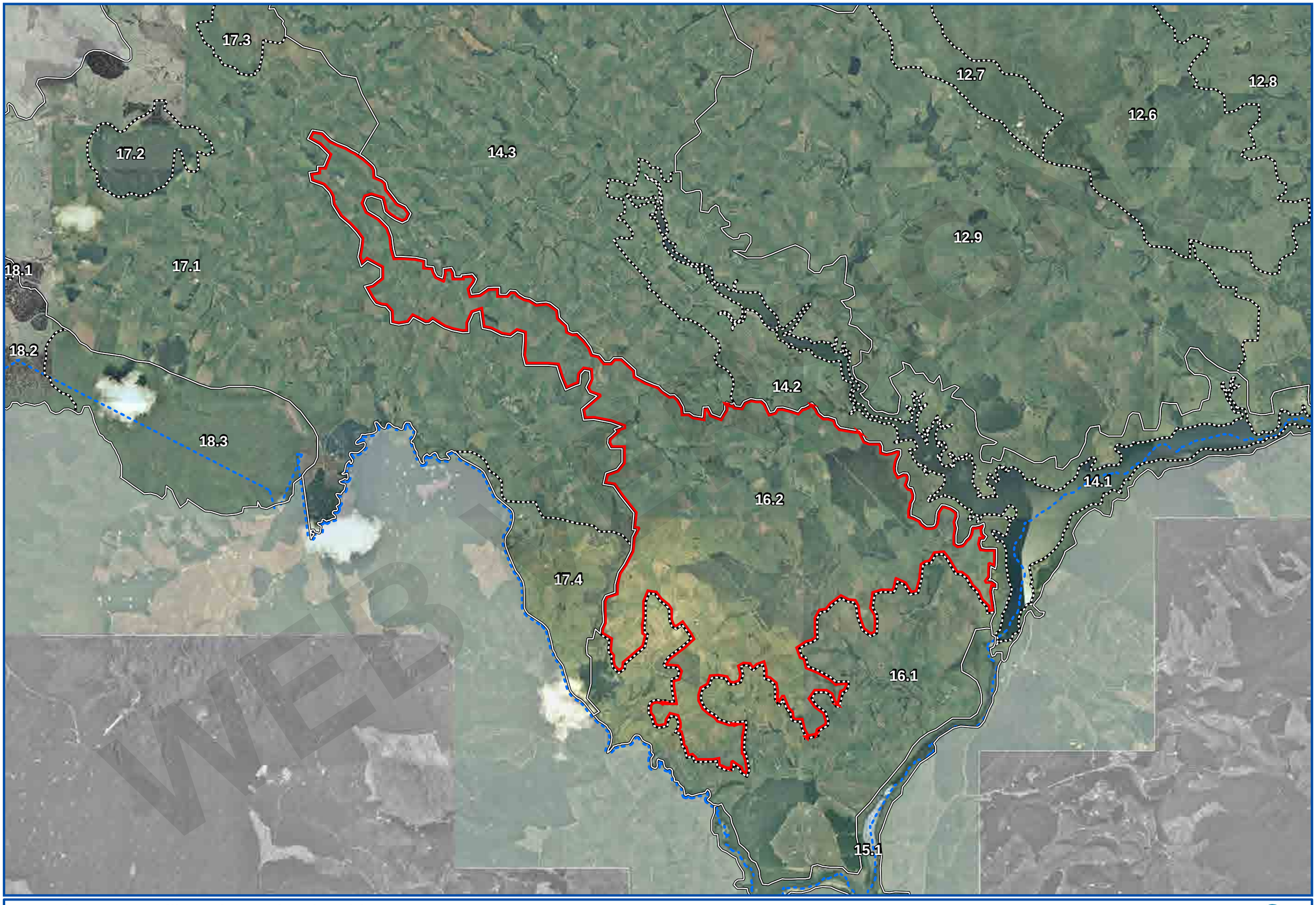
Local Character Areas:

- Western Production Forestry
- Eastern Pastureland

Landscape Management Issues:

- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities.
- Protection of scientific geothermal reserve that reflects an understanding that the underground extent of the field may be larger than the reserve and drilling within a wider proximate area may have adverse effects on the field.
- Recognition and management of cultural landscape values.

16.2



South-Western Hills and Poutakataka Ridge

0 0.5 1 km

1:75,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA — ROTORUA DISTRICT COUNCIL

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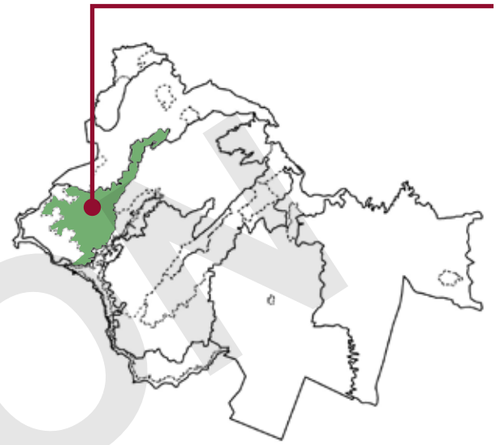
16.0 NGAPOIPOIATORE / POUTAKATAKA HILLS

Landscape Character Area 16.2: South-Western Hills and Poutakataka Ridge



Area Defined by:

- Waireka to the north.
- Tahunaatara Stream corridor to the west.
- Ohakuri Road Terraces to the south.
- Poutakataka Road to the east.

Area Characterised by:

- Harder volcanic parent material dominates throughout reflecting and extensive area of broken and dissected, strongly rolling to very steep hill country with a limited area of flat to undulating land associated within a contained and elevated upper catchment valley of the southern branch of the Tahunaatara Stream north of Galatos Road (see Map 2 and Map 4).
- Class 6 and 7 land dominates south of Galatos Road. Contains named hills Ngapoipoiatore (591m asl) and Motokiore 573m (asl) as well as other unnamed distinct steep hill features ranging in approximate height from 400 to 550m asl (see Map 8).
- North of Galatos Road characterised by a distinct narrow (1.4 km – 1.8 km) upland ridge landform in a northeast – southwest alignment that runs for approximately 11.5 km from Galatos Rd to Waikaukau Road in the north including a lesser sub-ridge outlier to the northeast (489m asl) west of Twist Road.
- Class 6 land dominant north of Galatos Road with some Class 7 in steeper more defined hill and hill scarp areas. Named hill features include Poutakataka (509m asl) and Totara Hill (467m asl).
- Pastoral landcover dominant throughout with areas of exotic plantation forestry to the south, south of Galatos Road. With isolated patches of indigenous forest cover (5 – 20ha average size) limited to stream gullies and steeper scarps. Includes Maleme Bush Scenic Reserve (17ha, DoC), off Maleme Road (see Map 7).
- First and second order unnamed drainage patterns that drain to the east via the Totara Stream catchments to Lake Ohakuri and west via the Tahunaatara Stream system to Lake Atiamuri (see Map 6).
- Upland hill features of cultural significance including Poutakataka, Totara and Ngapoipoiatore.

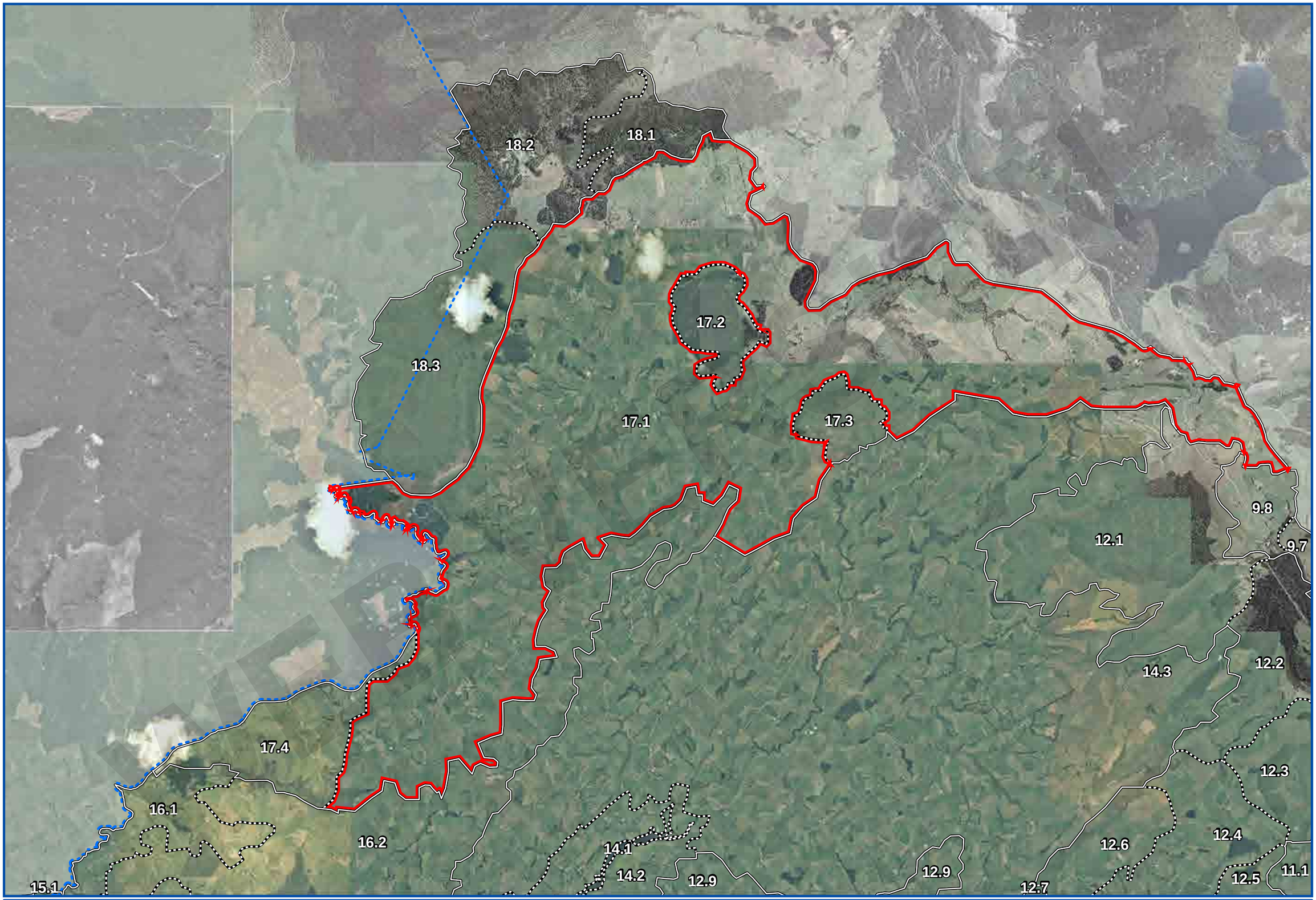
Local Character Areas:

- Narrow Ridge Lands North of Galatos Road
- Southern Hill Country

Landscape Management Issues:

- Management of steep to very steep pastoral and forestry lands for soil and water quality.
- Protection and enhancement of current patterns of indigenous vegetation in relation to steep slopes and riparian margins.
- Recognition and management of cultural landscape values.

17.1



Waireka Valley

0 0.5 1 km

1:75,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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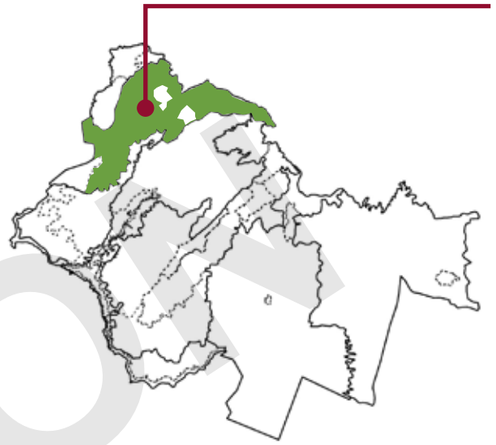
17.0 WAIREKA

Landscape Character Area 17.1: Waireka Valley



Area Defined by:

- Lake Rotorua Catchment boundary in the north.
- Horohoro Cliffs and Rotorua District Boundary with South Waikato District in the west.
- Ngapoipoiatore / Poutakataka Hills in the south.
- Northern Rotohouhou Stream corridor in the east.

Area Characterised by:

- Extensive area of mostly contiguous unconsolidated underlying geology including bedded sands / silt and gravel deposits of the Waikato – Rotorua regions with gully erosion prevalent. Some limited areas of Taupo and Kaharoa tephra also feature as well as small areas of erosion prone older ash deposits (see Map 5).
- Includes upland features including Waikaukau Hill (361m asl) identified as of cultural landscape significance and the small volcanic dome of Round Hill (449m asl).
- A significant area of older breccia material and associated broken hill country north and east of Ongahoro that is part of the upper Waikaukau Stream and associated Kapenga swamp system.
- Class 6 land dominant north east of Ongahoro with associated rolling to strongly rolling terrain with some areas of Class 7 land associated with very steep hill scarp areas (see Map 8).
- Class 6 land associated with adjoining upland units and associated hill country and more moderately sloped Class 4 and 3 land characteristic of valley landforms characterise the western Waireka valley.
- Pastoral landcover with areas of herbaceous freshwater vegetation associated with the Kapenga Swamp Government Purpose (Wildlife Management) Reserve in the east (see Map 7 and Map 10).
- The complex upper sub-catchment drainage patterns of the Mangakara, and Pokaitu Streams that drain south to the wider Tahunaatara and Whangaroa Streams that in turn drain to Lake Atiamuri and on to the Waikato River. Includes Waikaukau Stream and Kapenga swamp which contains 16% in area of all wetland remaining in the Atiamuri ecological district and is of very high conservation value (see Map 6).
- Horohoro Geothermal Field and hot springs north of Collier Road.
- Rural community centres of Horohoro, Waireka and Guthrie.

Local Character Areas:

- Waireka Valley
- Waikaukau Upper Sub-Catchments

Landscape Management Issues:

- Management of steep to very steep pastoral and forestry lands for soil and water quality including the protection and enhancement of patterns of riparian vegetation.
- Protection of existing wetland habitats of the Kapenga swamp system.
- Strengthening of existing patterns of herbaceous freshwater vegetation and the appropriate pastoral land use management of adjoining farmland including Ongahoro (Ongahoro character area 17.3 below).

17.2

17.1

17.2

Haparangi

0 0.5 1 km

1:10,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
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17.0 WAIREKA

Landscape Character Area 17.2: Haparangi

Area Defined by:

- Distinct volcanic dome identified as a geopreservation feature and noted as a prominent rhyolite dome (688m asl).
- Surrounded by adjoining pastoral lowlands (Waireka Valley character area 17.1 above)

Area Characterised by:

- Production forestry landcover with a limited area of exotic shrubland to the south.
- Steep to very steep dome scarps, Class 7 land, with strongly rolling upper dome terrain, Class 4 (see Map 4 and Map 8).
- Minor first order drainage patterns of the Mangakara and Waikaukau Stream systems.
- Visual prominence in relation to SH30 and characteristic of singular and isolated volcanic dome landforms that contrast with surrounding lower elevation terrain.
- Cultural landscape values and associations (see Map 12).

Local Character Areas:

- N/A

Landscape Management Issues:

- Management of future harvest regimes and landcover in relation to wider scenic and amenity landscape values and surrounding upland features such as the Horohoro Cliffs and uplands.
- Recognition and management of cultural landscape associations.

17.3

Ongahoro

0 0.5 1 km

1:10,000 Aerial Source: Rotorua District Council: 2001, 2006.

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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17.0 WAIREKA

Landscape Character Area 17.3: Ongahoro

Area Defined by:

- Rhyolite dome defined by surrounding lower elevation pastoral land (Waireka Valley Character Area 17.1 above)

Area Characterised by:

- Rhyolite dome (566m asl) within the Kapenga caldera (see Map 4 and Map 2).
- Visual prominence in relation to Rehi Road and characteristic of singular and isolated volcanic dome landforms that contrast from surrounding lower elevation terrain.
- Steep to very steep dome scarps with strongly rolling upper dome terrain.
- Class 7 lands associated with steeper western and northern scarps. Class 6 land to the east and south on wider dome (see Map 8).
- Pastoral landcover predominates with some production forestry on the steeper western scarps.
- Minor upland tarn / pond features (see Map 2 and Map 3).
- Cultural landscape values and associations.
- Minor first order drainage patterns that include north and north east gullies that drain to Kapenga swamp (see Map 6).

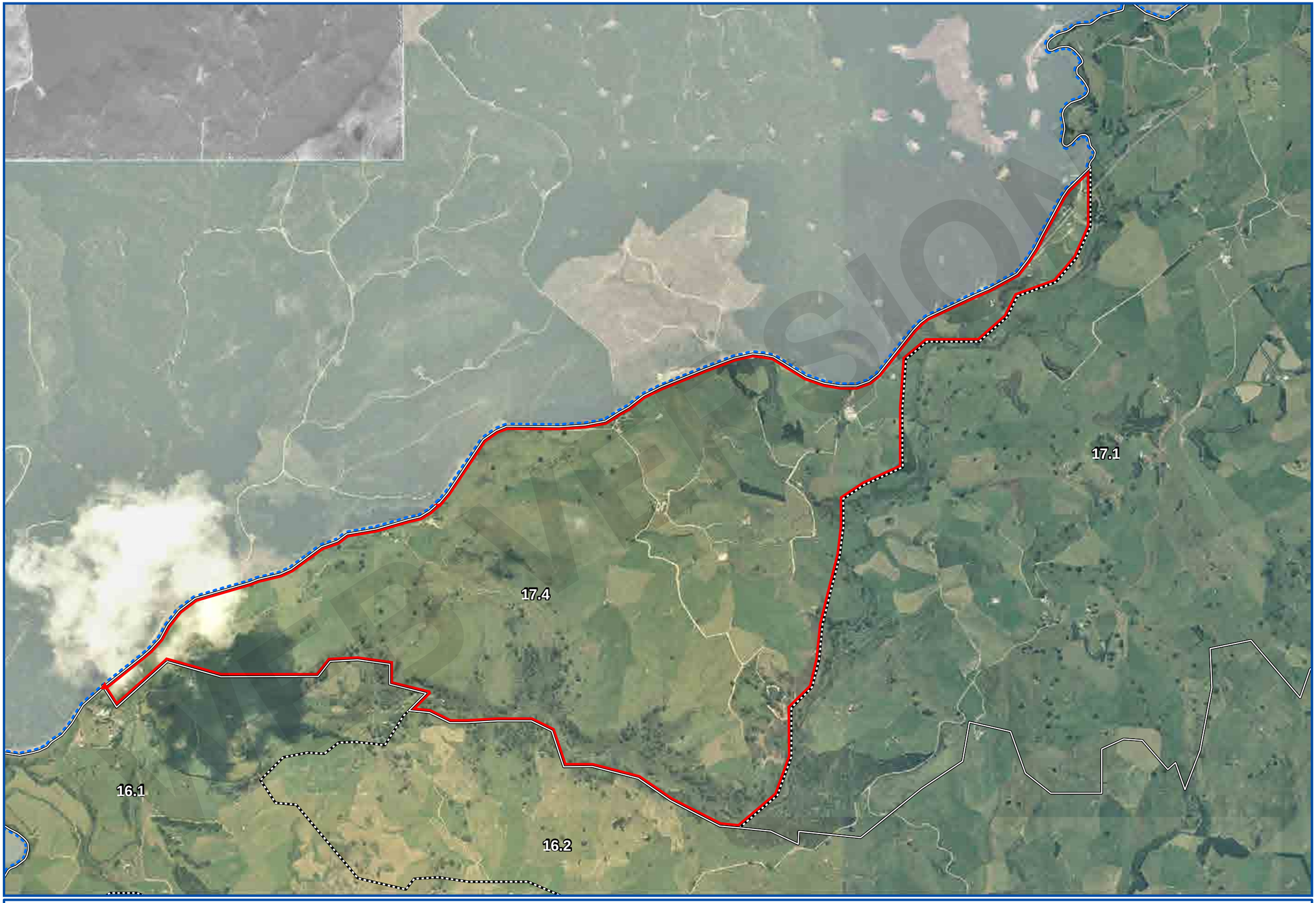
Local Character Areas:

- N/A

Landscape Management Issues:

- Management of steep erosion prone slopes and soil and water quality particularly in relation to areas of high ecological value (Kapenga Swamp)
- Recognition and management of cultural landscape associations.

17.4



Tahunaatara Stream North

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

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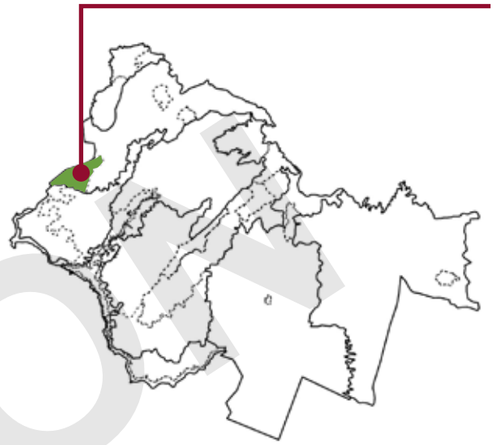
17.0 WAIREKA

Landscape Character Area 17.4: Tahunaatara Stream North



Area Defined by:

- District boundary with South Waikato District in the north (SH30).
- Tahunaatara Stream corridor to the west, south and east.

Area Characterised by:

- Dissected strongly rolling to very steep terrain reflecting a mix of underlying parent materials from harder volcanic base rock in the west to more unconsolidated material in the east reflected in steeper dissected hill country in the west easing to more moderate sloping land in the east (see Map 5).
- Adjoining forestry land to the north (South Waikato District).
- Pastoral landcover throughout excluding indigenous vegetation associated with Tahunaatara Stream corridor (Tahunaatara Stream Marginal Strip – DoC) (see Map 7 and Map 6).
- Reserve A (public) land west of Parsons Rd on SH30 and following the Tahunaatara Stream and adjoining the Tahunaatara Stream Marginal Strip to the east.
- First order south draining gullies of the Tahunaatara Stream system.

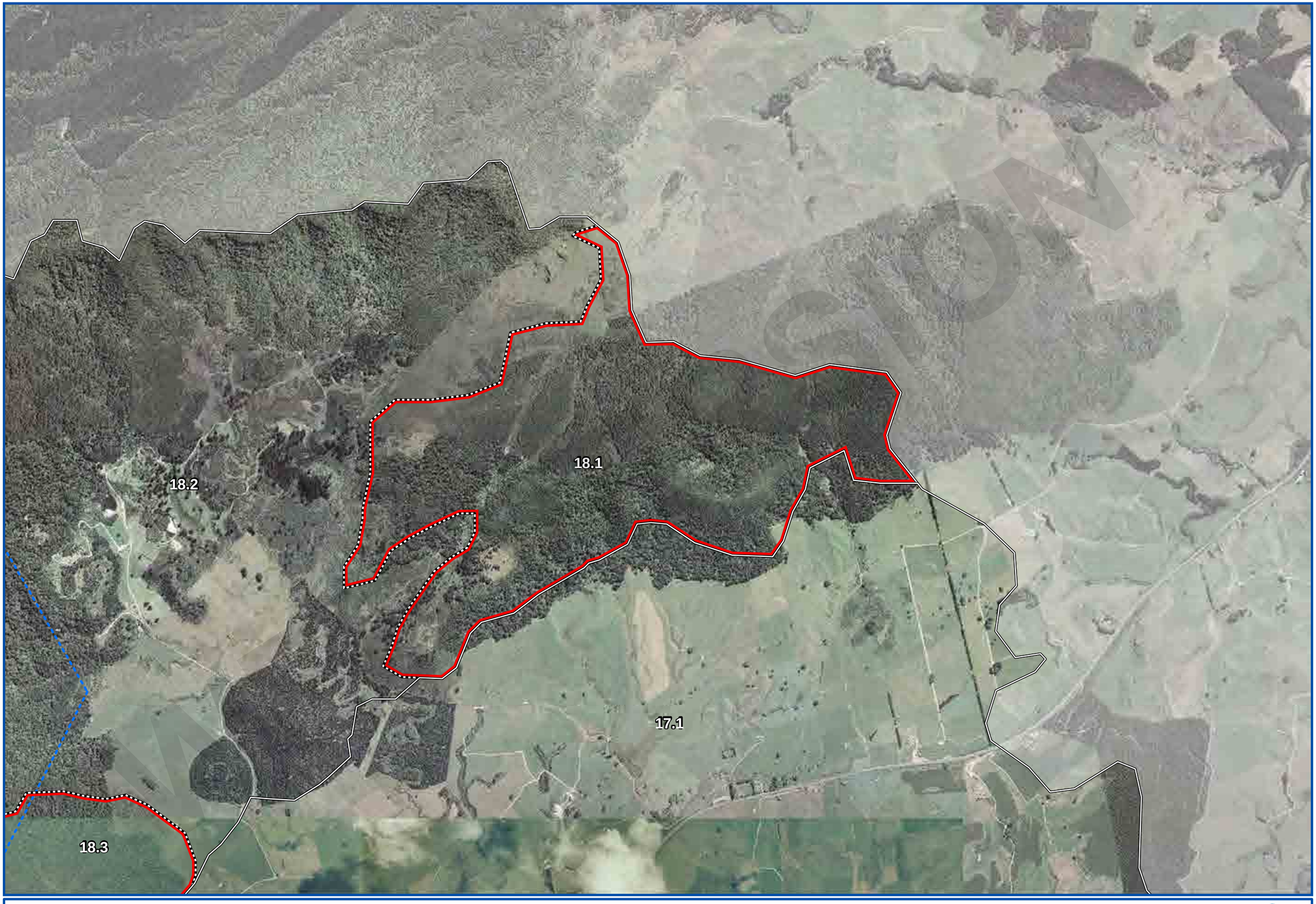
Local Character Areas:

- Western Dissected Hills.
- Eastern Rolling Hills.

Landscape Management Issues:

- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities. In particular the management of rural land use activities in regard to soil and water quality.

18.1



Tureporepo Hills

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

Boffa Miskell
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18.0 HOROHORO

Landscape Character Area 18.1: Tureporepo Hills

Area Defined by:

- Lake Rotorua Catchment boundary to the north.
- District boundary with South Waikato District to the west.
- Pokaitu Valley to the south.
- Waireka Valley to the east.

Area Characterised by:

- Volcanic upland ridge / dome feature rising from the surrounding pastoral valley floor and separate from the Pokaitu Valley scarps to the west (see Map 4).
- Class 6 and 7 land dominates steeper dome scarp areas with limited areas of Class 4 land associated with the more moderate terrain of the upper elevation dome terraces (see Map 8).
- Indigenous vegetation landcover predominates including the Tureporepo Bush of considerable ecological significance as an easily accessible, relative to Rotorua City, representative (albeit modified) area of forest remnant previously common throughout the District (General Rural A zoning - see Map 11).
- West and southwest draining first order gullies of the Pokaitu Stream system, south draining first order gullies of the Mangakara Stream system (see Map 6).

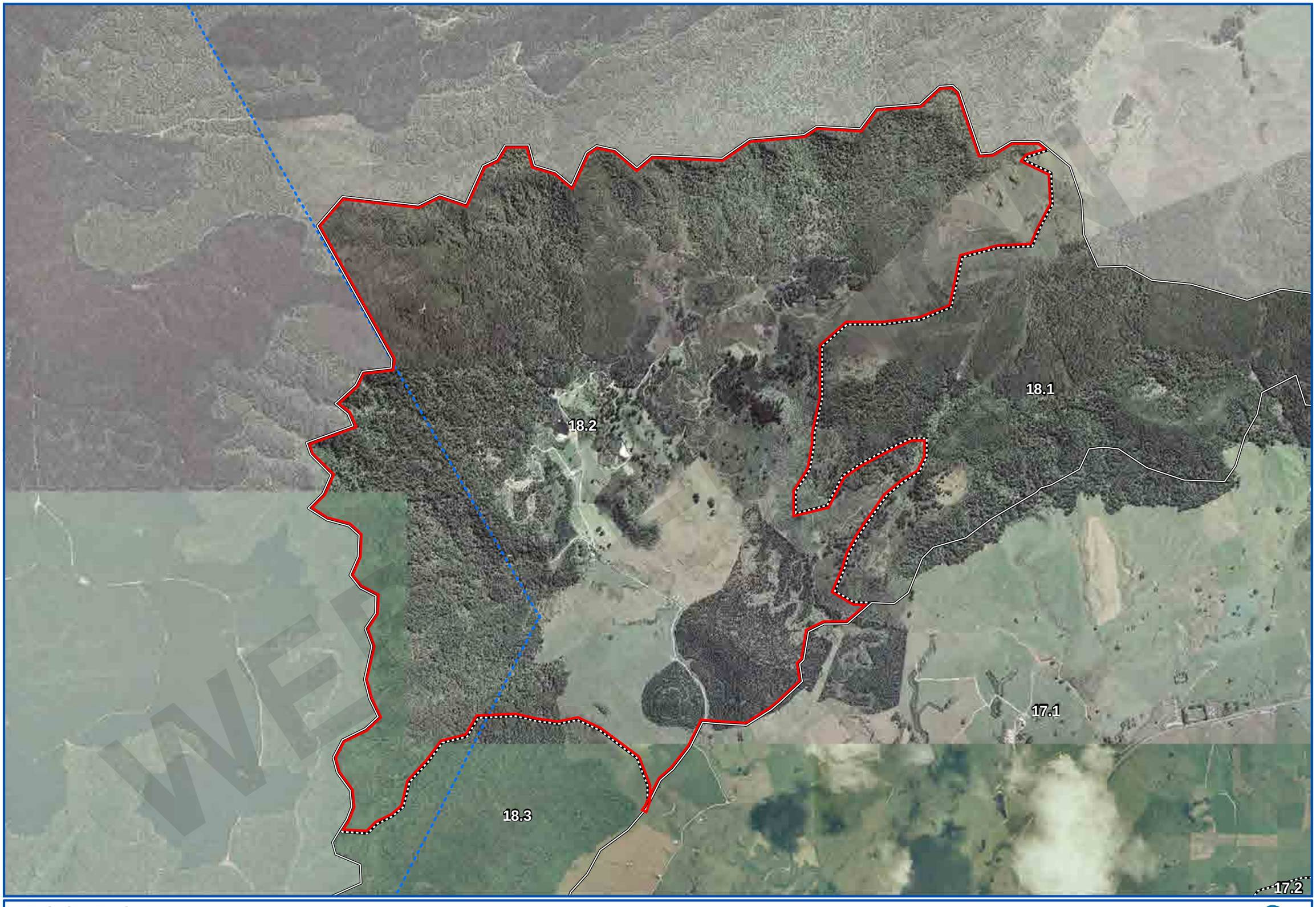
Local Character Areas:

- N/A

Landscape Management Issues:

- Scenic protection relative to SH30 as a key landscape element in the western upland bush continuum from the Lake Rotorua Catchment boundary south to the southern end of the Horohoro Cliffs.
- Potential damage to indigenous vegetation from uncontrolled stock browsing.
- Management of wilding pines.
- Consideration of potential recreational, educational and amenity landscape values.

18.2



Pokaitu Basin

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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18.0 HOROHORO

Landscape Character Area 18.2: Pokaitu Basin

Area Defined by:

- Lake Rotorua Catchment Boundary to the north.
- District boundary with South Waikato District to the west.
- Waireka valley to the south.
- Tureporepo Bush to the east.

Area Characterised by:

- Contained valley basin landform characterised by underlying geology of steep volcanic caldera slopes easing to alluvial tephra material further east towards mid basin slopes (see Map 5).
- Minor rhyolite dome features between Horohoro Cliffs and Tureporepo Bush in exotic forest cover.
- Class 7 dominant with limited areas of Class 4 land associated with fourth order reaches of the Pokaitu Stream corridor (see Map 8).
- Fragmented landcover patterns characterised by areas of contiguous bush and potentially ecologically significant areas of indigenous vegetation in the upper basin slopes as well as cleared pastoral / fragmented forest land and some limited forestry land to the east and south (see Map 7).
- Numerous buildings and access roads including forestry tracks.
- Three small (between 4000m2 - 1.2ha) lake features
- Upper sub-catchments of the Pokaitu Stream system (see Map 6).

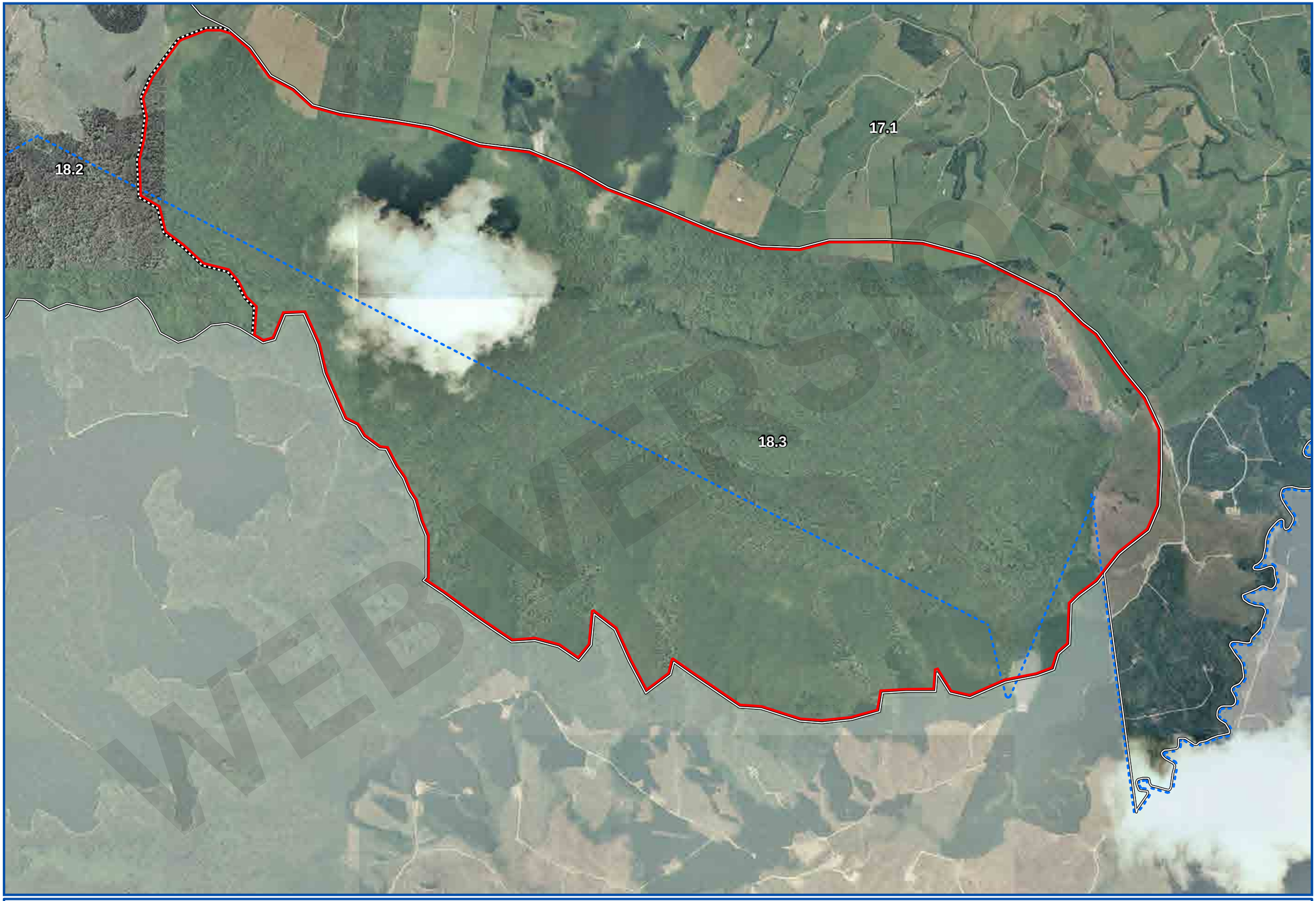
Local Character Areas:

- Upper Basin Bushland
- Mid valley fragmented Landcover Land
- Dome Production Forestry

Landscape Management Issues:

- Management of future harvesting of pine forest on steep dome landforms.
- Recognition of established primary industry sponsored, Regional Council and National Government Agency environmental programmes and initiatives in relation to the sustainable management of existing rural land use activities.

18.3



Horohoro Dome and Escarpment

0 0.5 1 km

1:20,000 **Aerial Source: Rotorua District Council: 2001, 2006.**

Landscape Type
Landscape Character Area
Rotorua District Council Boundary

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

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18.0 HOROHORO

Landscape Character Area 18.3: Horohoro Dome and Escarpment

Area Defined by:

- Pokaitu Valley in the north.
- District Boundary with South Waikato District in the west.
- Northern terraces of the Rahopakapaka Stream corridor to the south (colluvial toe slopes of southern bluffs).
- Waireka Valley to the east.

Area Characterised by:

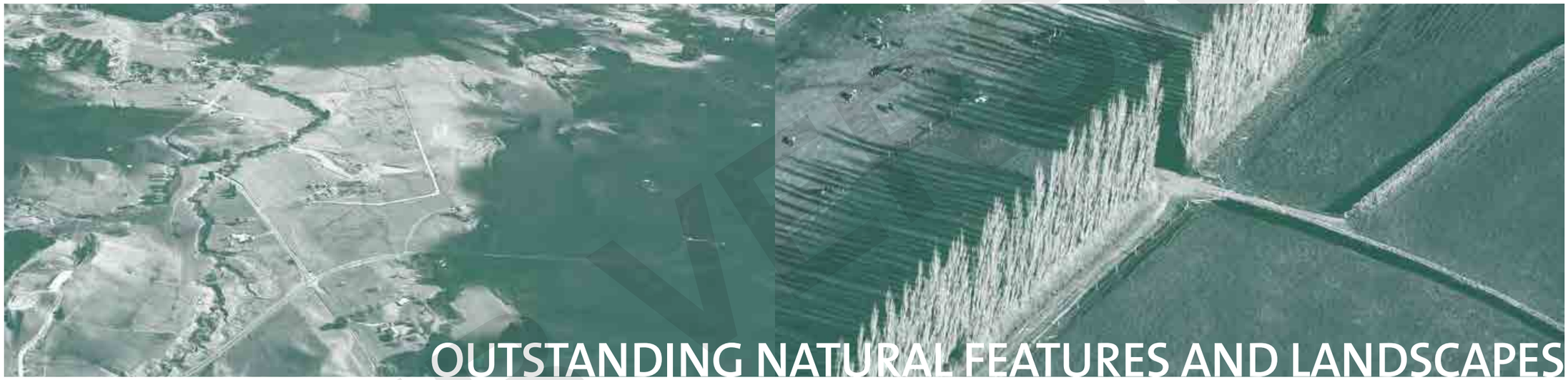
- Prominent intra-caldera rhyolite dome within the Kapenga caldera (approximately 800m asl) summiting to 835m asl truncated on the eastern side by extreme down faulting (see Map 2 and Map 4) .
- Upper dome (Class 6 land with rolling to strongly rolling terrain).
- Approximately 6 km of near vertical rhyolite bluffs / cliffs / escarpments and rocky outcrops (Class 8).
- Indigenous forest of very high potential ecological value. Includes Horohoro Forest Southern Outlier (DoC).
- Highly visible and legible as a distinct landform particularly from SH30.
- Adjoining Horohoro Forest stewardship Area (DoC) (see Map 10).
- Recognised cultural landscape associations.

Local Character Areas:

- Horohoro Escarpments
- Horohoro Dome

Landscape Management Issues:

- Maintenance of stock exclusion fencing on adjoining pastureland.
- Control of pests and predators in regard to ecological values.
- Consideration of current District Plan zoning of Rural A (General) zone and the relative level of protection that this zone provides for in regard to landscape, cultural and ecological values. .
- Enhancement of recreational and amenity landscape values through improved and appropriate public access.
- Recognition and management of cultural landscape values.



OUTSTANDING NATURAL FEATURES AND LANDSCAPES

Outstanding Natural Features and Landscapes

Introduction

The project brief requires the identification of outstanding natural features and landscapes. This work is being undertaken to meet the Council's obligations under Part II of the Resource Management Act (the RMA), being:

> *Section 6(b)*
>
> *"The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development."*

As stated previously the RMA does not define "outstanding" or provide guidance as to how outstanding natural features and landscapes are to be identified. Outstanding natural features and landscapes in this study have been identified as both features and landscapes with exceptional physical qualities and characteristics and/or features that are highly valued for one or more attributes.

ONFLs have been identified and mapped as part of this study. Landscape management issues in relation to identified ONFLs should be considered within the wider integrated framework of the Landscape Types and Landscape Character Areas described in Part I of this report.

While the focus of this study is Section 6(b) of the RMA, it is also recognised that the study will assist Council to meet its obligations under other sections of Part II of the RMA – particularly Section 7(c) and 7(f). These sections of the RMA, which are other matters to which regard is to be given, include the maintenance and enhancement of amenity values and the quality of the environment.

Amenity Values are defined in the Act as follows:

> *"those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes".*

The Environment Court, primarily through decisions in relation to the Queenstown Lakes District Plan, has indicated the following three distinctions between landscapes being:

- Section 6(b) landscapes: outstanding natural features and landscapes;
- Section 7 landscape: amenity landscapes being those landscapes with important visual amenity values;
- Those other landscapes with no significant resource management issues.

Section 6(b) relates to other matters of national importance such as Section 6(a) in regard to the preservation of the natural character of wetlands and lakes and rivers and their margins and the protection of them from inappropriate subdivision, use and development.

The adoption of an assessment methodology that identifies and describes Landscape Types and Landscape Character Areas prior to the specific identification of ONFLs provides a framework to assist Council, landowners and communities to manage landscape change in an integrated way depending on the particular landscape qualities and issues within each Landscape Character Area.

Assessment Criteria

The assessment criteria used in the identification of the ONFLs of the study area have been adopted from the Environment Bay of Plenty Regional Policy Statement (RPS) (the criteria were introduced through Variation 1). These criteria are in turn drawn from decisions of the Environment Court in firstly the Pigeon Bay and then the Wakatipu Environmental Society Inc and others v Queenstown-Lakes District Council (C 180/99) decisions (otherwise known as 'WESI' criteria). The criteria adopted for the assessment of the ONFLs are as follows:

Natural Science Factors comprising the following three criteria:

Representativeness

Natural features and landscapes are clearly and recognisably characteristic of the district. The key components of the landscape will be present in a way that more generally defines the character of the place, but which distils this character and essence.

Natural features in a good state of preservation are representative and characteristic of the natural geological processes and diversity of the district.

Research and Education

Natural features and landscapes that are valued for the contribution they make to research and education.

Rarity

Natural features that are unique or rare in the district, region or nationally, and few comparable examples exist.

Aesthetic Values comprising the following four criteria:

Coherence

The patterns of land cover and land use are largely in harmony with the underlying natural pattern of the landform of the area and there are no significant discordant elements of land cover or land use.

Vividness

Natural features and landscapes are widely recognised across the community and beyond the local area and remain clearly in the memory; striking landscapes that are symbolic of an area due to their recognisable and memorable qualities.

Naturalness

Natural features and landscapes that appear largely uncompromised by modification and appear to comprise natural systems that are functional and healthy.

Intactness

Natural systems that are intact and aesthetically coherent and do not display significant visual signs of human modification, intervention or manipulation; visually intact and highly aesthetic natural landscapes.

Expressiveness (Legibility)

Natural features and landscapes that clearly demonstrate the natural processes that formed them. Examples of natural process in landscape exemplify the particular processes that formed that landscape.

Transient Values

The consistent occurrence of transient features (for example the seasonal flowering of Pohutukawa or seasonal habitats of migratory birds) or active geothermal features that contribute to the character, qualities and values of the landscape; landscapes that are widely recognised for their transient features and the contribution these make to the landscape.

Shared and Recognised Values

Natural features and landscapes that are widely known and valued by the immediate and wider community for their contribution to a sense of place leading to a strong community association with or high public esteem for the place.

Maori Values

Natural features and landscapes that are clearly special or widely known to tangata whenua and influenced by their connection to the Maori values inherent in the place.

Historical Associations

Natural features and landscapes that are clearly and widely known to the community and influenced by their connection to the historical values inherent in the place.

Environment Bay of Plenty has prepared a 'user guide' ("proposed Change No.1 to the Bay of Plenty Regional Policy Statement (Heritage Criteria) User Guide 29 November 2005) that provides further description and examples in relation to the application and interpretation of the above criteria.

Selection Process Methodology

The identification of potential ONFLs has been derived from the Landscape Types and Landscape Character Areas documented in the preceding section.

The decision as to whether a particular natural feature or landscape qualified as outstanding was based on an initial assessment against the ONFL criteria. The professional judgement and expertise of three experienced Landscape Architects was used to evaluate the areas identified through preliminary assessment to determine whether a natural feature or landscape met the criteria for identification as "outstanding".

Community landscape values were also assessed as far as possible through the consultation processes including general public and Tangata Whenua consultation. The record of the assessment against criteria is set out in the worksheets in the following section. The decision on "ranking" is recorded in the assessment sheets attached to provide transparency for consultation, and baseline for any future reviews.

The ranking system adopts a 3 tier scoring system: L = low, M = moderate, H = high in relation to the extent to which the values of the subject ONFL meet the particular criterion.

It is important to recognise that the assessment against the criteria leading to the determination as to whether a particular landscape or feature is outstanding is not additive. This means that the method is not a scoring system that requires scores for individual criteria to be added to gain one overall score based on which the determination is made. A landscape or feature may achieve the status of outstanding due to the way in which it meets a single criterion such as, for example, "expressiveness".

Alternatively, an area can be determined to be 'outstanding' due to the way in which it meets a combination of criteria. This method of evaluation is as intended in the RPS. Therefore while each criterion has a ranking, a landscape or feature that "rates" moderate or even low in relation to some criteria may still achieve recommended "outstanding" status due to the way in which it exceptionally meets the attributes of a particular single criterion.

Whilst this landscape study identifies the ONFLs within the study area, a significant portion of the study area remains outside of such a delineation. These 'amenity' and 'other' landscapes are nevertheless important to the overall character and quality of the landscape as a whole. It is important that these landscapes are also managed to work with, enhance and protect their inherent landscape values.

The study enables the Council to meet its obligations under Section 6(b) matters of national importance as well as other sections of Part II of the RMA, particularly Section 7(c). This is important in an area such as the Northern Lakes catchments where the majority of the land area is not identified as outstanding but where the working rural landscape is important to the overall character of the district and the community's identity. These natural and rural landscape values and the amenity of the working rural landscape are also of value to visitors and tourists.

The tourism industry is also important to Rotorua's economy and the wider impression of New Zealand as a rural, quality destination. It is important to recognise that working landscapes change seasonally and over time as different techniques of rural land management and production regimes change and diversify. Such change is inherent within the working rural landscape and should be accommodated without hindrance where significant landscape values are not undermined. In addition, opportunities for enhancement can result from rural landscape change.

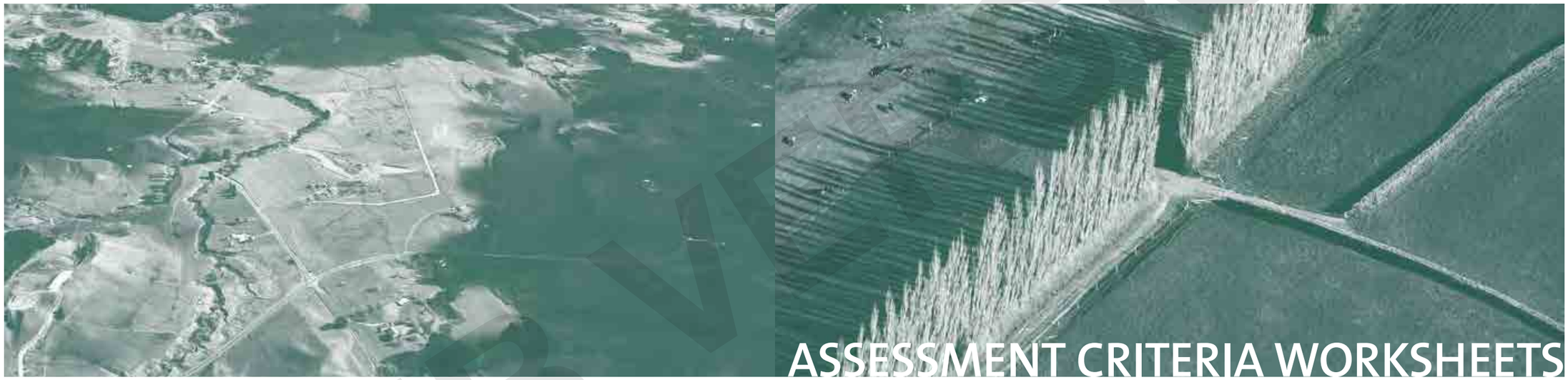
Identification of Outstanding Natural Features and Landscapes

Four outstanding natural features and landscapes (ONFL) have been identified in the Northern Lakes catchment study area (refer Map 13, Appendix 1). These are:

- Horohoro Dome and Escarpments
- Paeroa Range Western Scarps
- Waiotapu Geothermal Area
- Tumunui Hill

The location and extent of the above ONFLs are shown within the Study Areas Resource Map Book: Map 13.

Acknowledgement: *"Natural Heritage of the Rotorua District" (1998) Shaw. W.B, and Beadel. S. M., (Wildlands Consultants) has been used as a general reference in the preparation of the following assessments in regard to natural heritage values.*



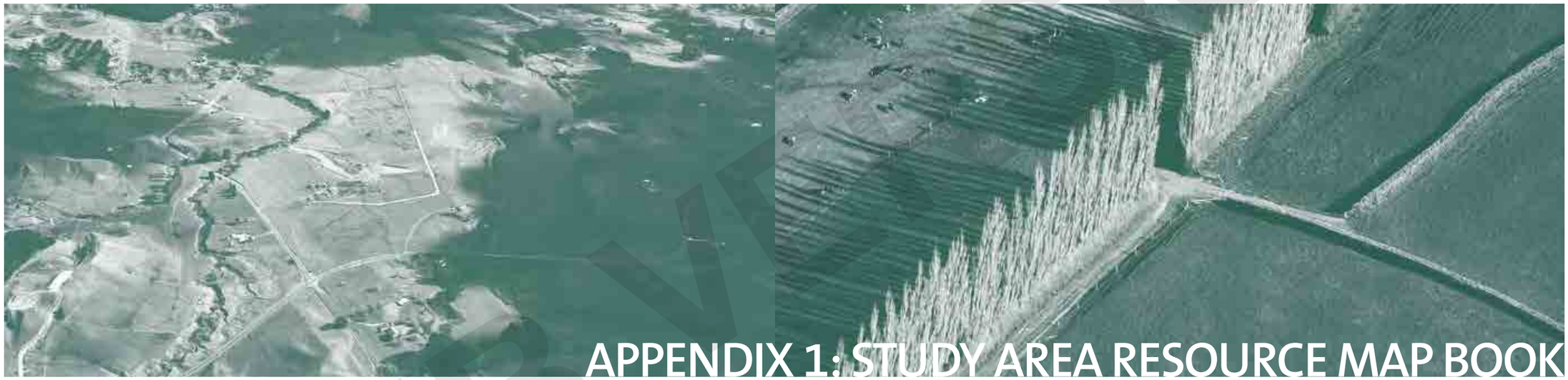
ASSESSMENT CRITERIA WORKSHEETS

ONFL name: Horohoro Dome and Escarpments		
Description: Highly prominent upland volcanic Rhyolite landform over 800m asl Includes upper dome and a near vertical escarpment series approximately 6 kilometres in length resulting from extreme down faulting. Northern end contiguous with the southern Mamaku Plateau landform. Includes indigenous forest assemblages of exceptionally high species diversity (Spring-Rice (in draft) in Natural Heritage of the Rotorua District, Shaw and Beadel, 1998).		
CRITERIA	**RANKING**	**COMMENT**
Natural Science Factors		
Representativeness Natural features and landscapes are clearly and recognisably characteristic of the area, district or region. The key components of the landscape will be present in a way that more generally defines the character of the place, but which distils this character and essence.	H	Key component of the southern Rotorua District landscape characteristic of upland volcanic landforms defines the character of geological diversity of the district with strong landform contrast with surrounding lowlands.
Natural features in a good state of preservation are representative and characteristic of the natural geological processes and diversity of the region.	H	Has been selectively logged in the past, however, indigenous forest cover is largely intact throughout with some production forestry on southern colluvial toe slopes.
Research and Education Natural features and landscapes are valued for the contribution they make to research and education.	H	High potential educational values in regard to species diversity and representative habitat qualities.
Rarity Natural features are unique or rare in the region or nationally, and few comparable examples exist.	H	Size and habitat diversity rare within the District with few comparable examples of similar upland forest assemblages and landform features. Kokako, kaka and blue duck have been recorded (Spring-Rice, ibid).
Aesthetic Values		
Coherence The patterns of land cover and land use are largely in harmony with the underlying natural pattern of the landform of the area and there are no significant discordant elements of land cover or land use.	H	High coherence of landform and indigenous forest cover.
Vividness Natural features and landscapes are widely recognised across the community and beyond the local area and remain clearly in the memory; striking landscapes are symbolic of an area due to their recognisable and memorable qualities.	H	Highly recognisable and visible even from the north with the Lake Rotorua catchment as far north as SH30 near Lake Rotokawau.
Naturalness Natural features and landscapes appear largely uncompromised by modification and appear to comprise natural systems that are functional and healthy.	H	While some selective logging has occurred in the past, regeneration is also occurring with high ecological / habitat values.
Intactness Natural systems are intact and aesthetically coherent and do not display significant visual signs of human modification, intervention or manipulation; visually intact and highly aesthetic natural landscapes.	H	Little visible sign of human modification. Clear delineation with adjoining farmland to the east.
Expressiveness (Legibility)		
Natural features and landscapes clearly demonstrate the natural processes that formed them. Examples of natural process in landscape exemplify the particular processes that formed that landscape.	H	Highly expressive of underlying geological processes in particular down faulting and the resultant escarpment features.
Transient Values		
The consistent occurrence of transient features (for example the seasonal flowering of pohutukawa) contributes to the character, qualities and values of the landscape; landscapes are widely recognised for their transient features and the contribution these make to the landscape.	M	Transient qualities in association with varying climatic conditions and variability of landform visibility.
SUMMARY OF LANDSCAPE ASSESSMENT	H	Outstanding natural landscape and escarpment features.
Note: The ranking system adopts a 3 level scoring system: L = low, M = moderate, H = high in relation to the extent to which the values of the subject ONFL meet the particular criterion.		
Shared and Recognised Values		
Natural features and landscapes are widely known and valued by the immediate and wider community for their contribution to a sense of place leading to a strong community association with or high public esteem for the place.	M	Highly visible and prominent landmark that is viewed clearly form State Highway 30.
Maori Values		
Natural features and landscapes are clearly special or widely known and influenced by their connection to the Maori values inherent in the place.	H	Known association with eponymous ancestors of Te Arawa.
Historical Associations		
Natural features and landscapes are clearly and widely known and influenced by their connection to the historical values inherent in the place.	M	Association with eponymous ancestors of Te Arawa and events relating to early exploration.
OVERALL ASSESSMENT	H	Outstanding Natural Landscape of high cultural significance

ONFL name: Paeroa Range Western Scarps		
Description: Near vertical to very steep upland scarps of the western face of the Paeroa Range. Includes areas of indigenous vegetation and unique geothermal plant communities and species associated with geothermal areas. Steaming cliffs, springs, geothermal pools and features to the south.		
CRITERIA	**RANKING**	**COMMENT**
Natural Science Factors		
Representativeness Natural features and landscapes are clearly and recognisably characteristic of the area, district or region. The key components of the landscape will be present in a way that more generally defines the character of the place, but which distils this character and essence.	H	Recognisable key landscape element that defines and contrasts with the surrounding rural lowlands.
Natural features in a good state of preservation are representative and characteristic of the natural geological processes and diversity of the district .	H	Steep scarp landform feature with a northeast – southwest alignment that typifies the wider series of upland to valley / plain landform transitions that characterise the landscapes of the southern Rotorua District.
Research and Education Natural features and landscapes are valued for the contribution they make to research and education.	H	High potential research and educational values associated with geothermal ecosystems and range of vegetation types from geothermal to sub-alpine.
Rarity Natural features are unique or rare in the region or nationally, and few comparable examples exist.	H	One of the north islands most important reserve areas (Clarkson, B.D. 1984a, in Natural Heritage of the Rotorua District, Shaw and Beadel, 1998).
Aesthetic Values		
Coherence The patterns of land cover and land use are largely in harmony with the underlying natural pattern of the landform of the area and there are no significant discordant elements of land cover or land use.	H	Highly coherent as a distinct scarp land form over 11 kilometres in length.
Vividness Natural features and landscapes are widely recognised across the community and beyond the local area and remain clearly in the memory; striking landscapes are symbolic of an area due to their recognisable and memorable qualities.	H	Striking and memorable landform feature that contrasts with the surrounding lower elevated pastureland. Symbolic of Waikite and Te Kopia Valley farm land landscapes.
Naturalness Natural features and landscapes appear largely uncompromised by modification and appear to comprise natural systems that are functional and healthy.	M	Some wildling pine infestation evident but otherwise highly unmodified and natural.
Intactness Natural systems are intact and aesthetically coherent and do not display significant visual signs of human modification, intervention or manipulation; visually intact and highly aesthetic natural landscapes.	H	Highly natural landscape qualities. Clear delineation of surrounding pasture farmland on western edge.
Expressiveness (Legibility)		
Natural features and landscapes clearly demonstrate the natural processes that formed them. Examples of natural process in landscape exemplify the particular processes that formed that landscape.	H	Highly expressive of underlying geological process. Contains active geothermal features.
Transient Values		
The consistent occurrence of transient features (for example the seasonal flowering of pohutukawa) contributes to the character, qualities and values of the landscape; landscapes are widely recognised for their transient features and the contribution these make to the landscape.	H	High transient values in relation to varying climatic conditions and variability of landform visibility and dynamic geothermal activity.
SUMMARY OF LANDSCAPE ASSESSMENT	H	Outstanding natural landscape and geothermal features.
Assessment provided by Boffa Miskell Ltd		
Note: The ranking system adopts a 3 level scoring system: L = low, M = moderate, H = high in relation to the extent to which the values of the subject ONFL meet the particular criterion.		
Shared and Recognised Values		
Natural features and landscapes are widely known and valued by the immediate and wider community for their contribution to a sense of place leading to a strong community association with or high public esteem for the place.	n/a	None known
Maori Values		
Natural features and landscapes are clearly special or widely known and influenced by their connection to the Maori values inherent in the place.	M	The maunga and range is associated with early Maori explorers, refuge and burial. Geothermal springs associated with exploration of Ngatoroirangi.
Historical Associations		
Natural features and landscapes are clearly and widely known and influenced by their connection to the historical values inherent in the place.	M	Association with eponymous ancestors of hapu descent groups and Te Arawa.
OVERALL Assessment	H	Outstanding Natural Landscape of high natural science and aesthetic values.

ONFL name: Waiotapu Geothermal Area		
Description: Unique geothermal wetland. One of the best geothermal wetlands in the Rotorua-Taupo Region (Clarkson, B.D. 1984a, in Natural Heritage of the Rotorua District, Shaw and Beadel, 1998). Contains a wide variety of geothermal features and associated indigenous vegetation assemblages including lakes (largest Lake Ngakoro 6.9ha) and streams, mud pools, craters, geysers and silica terrace features.		
CRITERIA	**RANKING**	**COMMENT**
Natural Science Factors		
Representativeness Natural features and landscapes are clearly and recognisably characteristic of the area, district or region. The key components of the landscape will be present in a way that more generally defines the character of the place, but which distils this character and essence.	H	Key component of the wider Waiotapu geothermal area. Clearly recognisable individual and collective geothermal landscape features.
Natural features in a good state of preservation are representative and characteristic of the natural geological processes and diversity of the region.	H	Highly representative of natural geological processes
Research and Education Natural features and landscapes are valued for the contribution they make to research and education.	H	High research and educational values associated with a large variety of features in a relatively confined area. High research values associated with thermal vegetation assemblages.
Rarity Natural features are unique or rare in the region or nationally, and few comparable examples exist.	H	Few comparable examples regionally and nationally.
Aesthetic Values		
Coherence The patterns of land cover and land use are largely in harmony with the underlying natural pattern of the landform of the area and there are no significant discordant elements of land cover or land use.	H	Highly coherent as a complex system of geothermal features. Strong surrounding indigenous vegetation patterns.
Vividness Natural features and landscapes are widely recognised across the community and beyond the local area and remain clearly in the memory; striking landscapes are symbolic of an area due to their recognisable and memorable qualities.	H	Striking and memorable individual landscape features and collective landscape experience.
Naturalness Natural features and landscapes appear largely uncompromised by modification and appear to comprise natural systems that are functional and healthy.	H	Highly natural processes evident and active.
Intactness Natural systems are intact and aesthetically coherent and do not display significant visual signs of human modification, intervention or manipulation; visually intact and highly aesthetic natural landscapes.	M	Human modification evident associated with public access and facilities (visitor centre).
Expressiveness (Legibility)		
Natural features and landscapes clearly demonstrate the natural processes that formed them. Examples of natural process in landscape exemplify the particular processes that formed that landscape.	H	Clear expression of underlying geological process.
Transient Values		
The consistent occurrence of transient features (for example the seasonal flowering of pohutukawa) contributes to the character, qualities and values of the landscape; landscapes are widely recognised for their transient features and the contribution these make to the landscape.	H	High transient values associated with dynamic geothermal activity.
SUMMARY OF LANDSCAPE ASSESSMENT	H	Outstanding series of features and surrounding landscape.
Note: The ranking system adopts a 3 level scoring system: L = low, M = moderate, H = high in relation to the extent to which the values of the subject ONFL meet the particular criterion.		
Shared and Recognised Values		
Natural features and landscapes are widely known and valued by the immediate and wider community for their contribution to a sense of place leading to a strong community association with or high public esteem for the place.	H	Well known and visited geothermal area.
Maori Values		
Natural features and landscapes are clearly special or widely known and influenced by their connection to the Maori values inherent in the place.	M	Association with eponymous ancestors of hapu descent groups. A resource gathering and settlement area. Significant Maori land holdings in the east.
Historical Associations		
Natural features and landscapes are clearly and widely known and influenced by their connection to the historical values inherent in the place.	M	Became a popular alternative to the Pink and White Terraces following the 1886 Tarawera eruption. Has been an international tourist destination for over 100 years and is a known area of Maori settlement.
OVERALL Assessment	H	Outstanding Natural Landscape of high natural science and aesthetic values.

ONFL name: Tumunui Hill		
Description: Rhyolite Lava Dome (761m asl); Distinct and highly prominent volcanic feature in relation to SH5 and surrounds with large area (560ha) of associated indigenous lowland to sub-montane vegetation. Includes steep northern bluff features. Significant area of intact indigenous vegetation representing a considerable part of the remaining indigenous vegetation within the Atiamuri Ecological District.		
CRITERIA	**RANKING**	**COMMENT**
Natural Science Factors		
Representativeness Natural features and landscapes are clearly and recognisably characteristic of the area, district or region. The key components of the landscape will be present in a way that more generally defines the character of the place, but which distils this character and essence.	H	Key landscape element of the southern Rotorua District. Clearly recognisable. Characteristic of individual volcanic dome features of the area.
Natural features in a good state of preservation are representative and characteristic of the natural geological processes and diversity of the region.	M	Modified forest systems with strong regenerating forest types.
Research and Education Natural features and landscapes are valued for the contribution they make to research and education.	M	Possible research values associated with native fauna.
Rarity Natural features are unique or rare in the region or nationally, and few comparable examples exist.	H	Considerable range of native bird species identified (Spring-Rice in Natural Heritage of the Rotorua District, Shaw and Beadel, 1998) including falcon, shining cuckoo and long tailed cuckoo.
Aesthetic Values		
Coherence The patterns of land cover and land use are largely in harmony with the underlying natural pattern of the landform of the area and there are no significant discordant elements of land cover or land use.	M	Upper elevated topography in harmony with indigenous vegetation patterns. Variation of exotic and indigenous patterns on the lower elevations and southern slopes.
Vividness Natural features and landscapes are widely recognised across the community and beyond the local area and remain clearly in the memory; striking landscapes are symbolic of an area due to their recognisable and memorable qualities.	M	Recognisable as an individual upland landscape feature.
Naturalness Natural features and landscapes appear largely uncompromised by modification and appear to comprise natural systems that are functional and healthy.	L	Modified.
Intactness Natural systems are intact and aesthetically coherent and do not display significant visual signs of human modification, intervention or manipulation; visually intact and highly aesthetic natural landscapes.	H	Highly visually intact.
Expressiveness (Legibility)		
Natural features and landscapes clearly demonstrate the natural processes that formed them. Examples of natural process in landscape exemplify the particular processes that formed that landscape.	H	Highly expressive of underlying geological processes.
Transient Values		
The consistent occurrence of transient features (for example the seasonal flowering of pohutukawa) contributes to the character, qualities and values of the landscape; landscapes are widely recognised for their transient features and the contribution these make to the landscape.	N/A	
SUMMARY OF LANDSCAPE ASSESSMENT	H	Outstanding Natural Landscape of high natural science and aesthetic values.
Note: The ranking system adopts a 3 level scoring system: L = low, M = moderate, H = high in relation to the extent to which the values of the subject ONFL meet the particular criterion.		
Shared and Recognised Values		
Natural features and landscapes are widely known and valued by the immediate and wider community for their contribution to a sense of place leading to a strong community association with or high public esteem for the place.	L	Visually prominent and distinct volcanic feature that can be viewed from State Highway 5. Tumunui does not possess a high profile in historical artworks, tourism literature and marketing or public interpretation.
Maori Values		
Natural features and landscapes are clearly special or widely known and influenced by their connection to the Maori values inherent in the place.	L	Is a locally known and recognised maunga.
Historical Associations		
Natural features and landscapes are clearly and widely known and influenced by their connection to the historical values inherent in the place.	L	Known association with Te Kooti and his followers during 1860s due to gun battles with British troops.
OVERALL Assessment	H	Representative, intact and expressive Outstanding Natural landscape. Key landscape element of the Southern Rotorua District.



APPENDIX 1: STUDY AREA RESOURCE MAP BOOK

Landscape Type and Character Area Definitions

Map 1: Landscape Types and Landscape Character Areas

Natural and Physical Resources

Map 2: NZMS 260 Topographic Series

Map 3: Aerial Photography

Map 4: Elevation

Map 5: Underlying Geology (New Zealand Land Resource Inventory)

Map 6: River Environments Classifications of New Zealand (NIWA)

Map 7: Land Cover Data Base (Landcare Research)

Landscape Assets

Map 8: Land Use Capability Units (Landcare Research) (see Appendix 2 for an explanation of Land Use Capability)

Map 9: Archaeological Sites and Geopreservation Sites

Map 10: Department of Conservation Reserves and QEII Covenants

Map 11: Rotorua District Council Zoning

Map 12: Rotorua Cultural Landscapes (Boffa Miskell 2007)

Map 13: Outstanding Natural Features and Landscapes

Landscape Types and Landscape Character Areas

10.0 Kaingaroa
- 10.1 Kaingaroa Forest Plateau
- 10.2 Kaingaroa Forest Settlement

11.0 Reporoa
- 11.1 Waiotapu Basin
- 11.2 Waiotapu Geothermal Area
- 11.3 Reporoa Plain
- 11.4 Reporoa Township

12.0 Paeroa Uplands
- 12.1 Tumunui Hill
- 12.2 Tutehu Hills
- 12.3 Maungaongaonga
- 12.4 Lake Ngapouri Basin
- 12.5 Ngapouri Hills
- 12.6 Paeroa Range Western Scarps
- 12.7 Central Paeroa Range
- 12.8 Southern Paeroa Foothills
- 12.9 North-Western Paeroa Foothills (Puaiti/Te Weta)

13.0 Waikato River
- 13.1 Waikato River
- 13.2 Waikato River Northern Bank

14.0 Lake Ohakuri and Surrounds
- 14.1 Lake Ohakuri
- 14.2 Lake Ohakuri and Whirinaki Valley
- 14.3 Whirinaki Basin

15.0 Atiamuri
- 15.1 Lake Atiamuri and Margins

16.0 Ngapoipoiatore/Poutakataka Hills
- 16.1 Ohakuri Road Terraces
- 16.2 South-Western Hills & Poutakataka Ridge

17.0 Waireka
- 17.1 Waireka Valley
- 17.2 Haparangi
- 17.3 Ongahoro
- 17.4 Tahunaatara Stream North

18.0 Horohoro
- 18.1 Tureporepo Hills
- 18.2 Pokaitu Basin
- 18.3 Horohoro Dome and Escarpment

Note: The numbering of these landscape character types and landscape character areas follows on from the Northern Lakes Assessment

Map 1. Landscape Types and Landscape Character Areas

Rotorua District Council Boundary
Landscape Character Area
Landscape Type
Lakes

Date: June 2010 Data Sources: Boffa Miskell Ltd, Terralink International Administrative Boundaries
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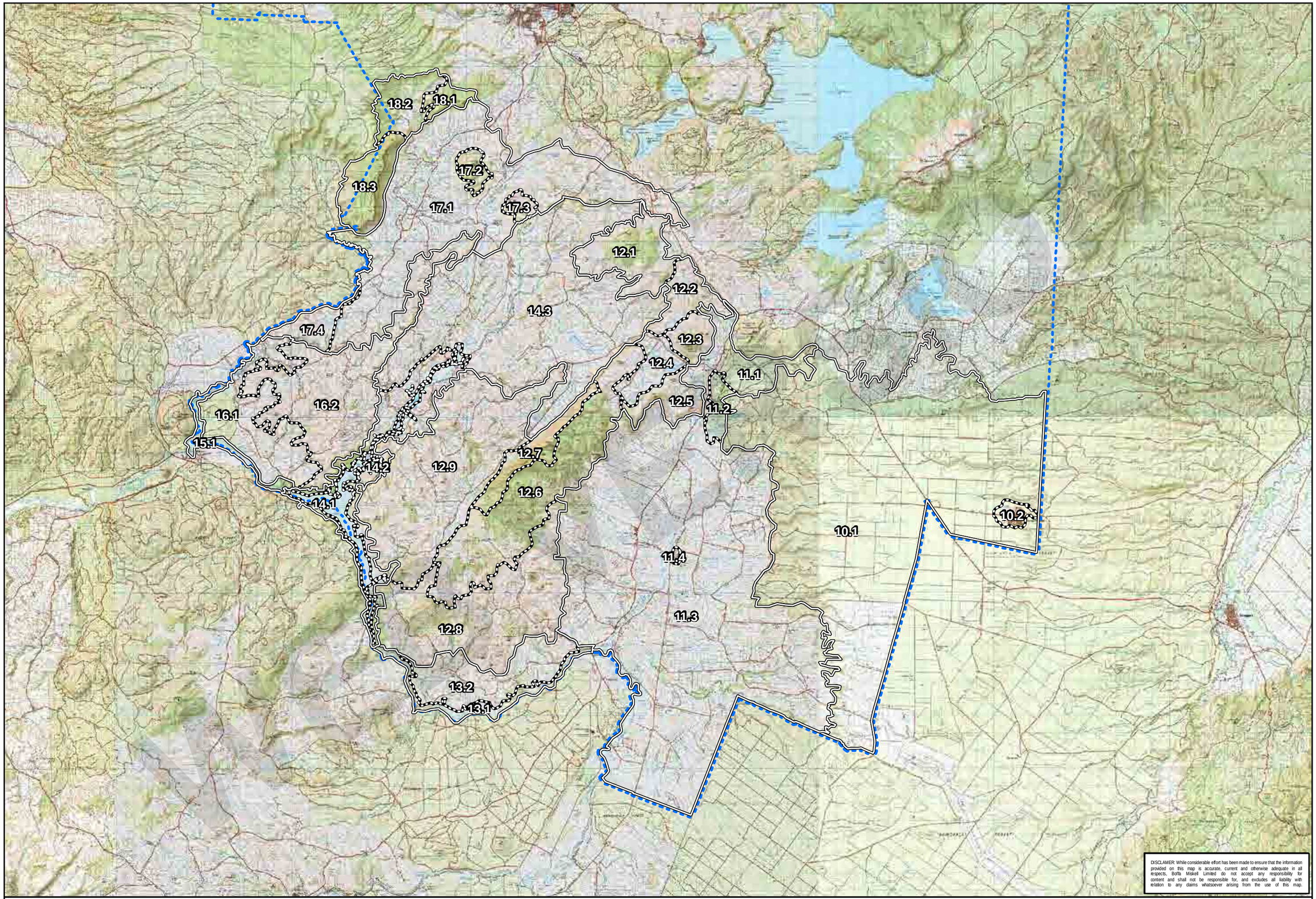

Map 2. NZMS260 Topographic Series

Rotorua District Council Boundary Landscape Character Area

Landscape Type

Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) New Zealand Map Series 260 (NZMS260)

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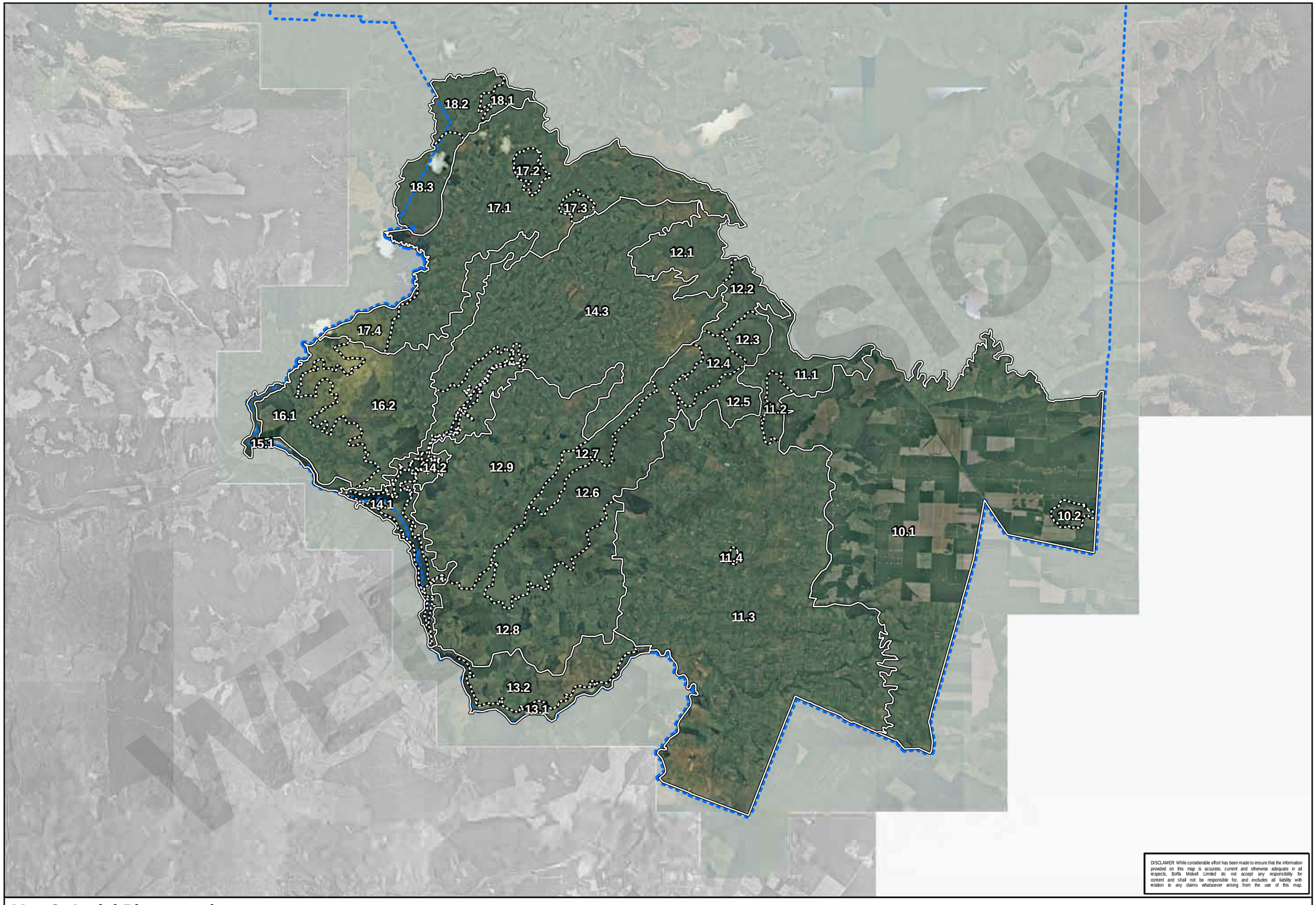

Map 3. Aerial Photography

Rotorua District Council Boundary Landscape Character Area

Landscape Type

Date: February 2009 Data Sources: Boffa Miskell Ltd, Rotorua District Council ortho-rectified aerial photography 2001, Land Information New Zealand (LINZ) ortho-rectified aerial photography 1996-2006

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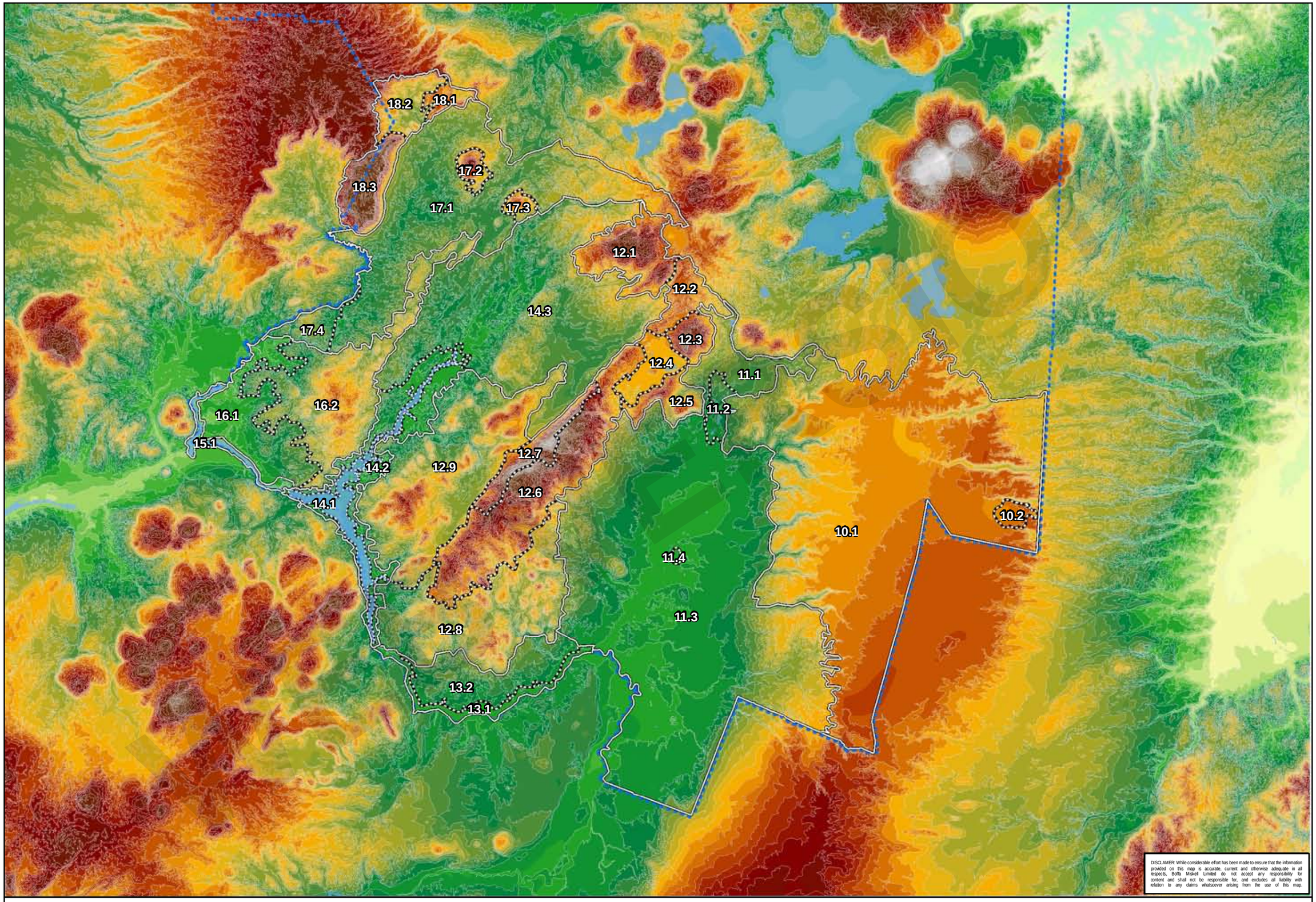

Map 4. Elevation

Rotorua District Council Boundary
Landscape Character Area
20m Contours
Landscape Type
Lake

Elevation (m)

20 - 40
40.1 - 60
60.1 - 80
80.1 - 100
100.1 - 120
120.1 - 140
140.1 - 160
160.1 - 180
180.1 - 200
200.1 - 220
220.1 - 240
240.1 - 260
260.1 - 280
280.1 - 300
300.1 - 320
320.1 - 340
340.1 - 360
360.1 - 380
380.1 - 400
400.1 - 420
420.1 - 440
440.1 - 460
460.1 - 480
480.1 - 500
500.1 - 520
520.1 - 540
540.1 - 560
560.1 - 580
580.1 - 600
600.1 - 620
620.1 - 640
640.1 - 660
660.1 - 680
680.1 - 700
700.1 - 720
720.1 - 740
740.1 - 760
760.1 - 780
780.1 - 800
800.1 - 820
820.1 - 840
840.1 - 860
860.1 - 880
880.1 - 900
900.1 - 920
920.1 - 940
940.1 - 960
960.1 - 980
980.1 - 1,000
1,000.1 - 1,020
1,020.1 - 1,040
1,040.1 - 1,060
1,060.1 - 1,080
1,080.1 - 1,100

1:200,000 @ A3
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Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) lakes & 20m contours (elevation derived from 20m contours)
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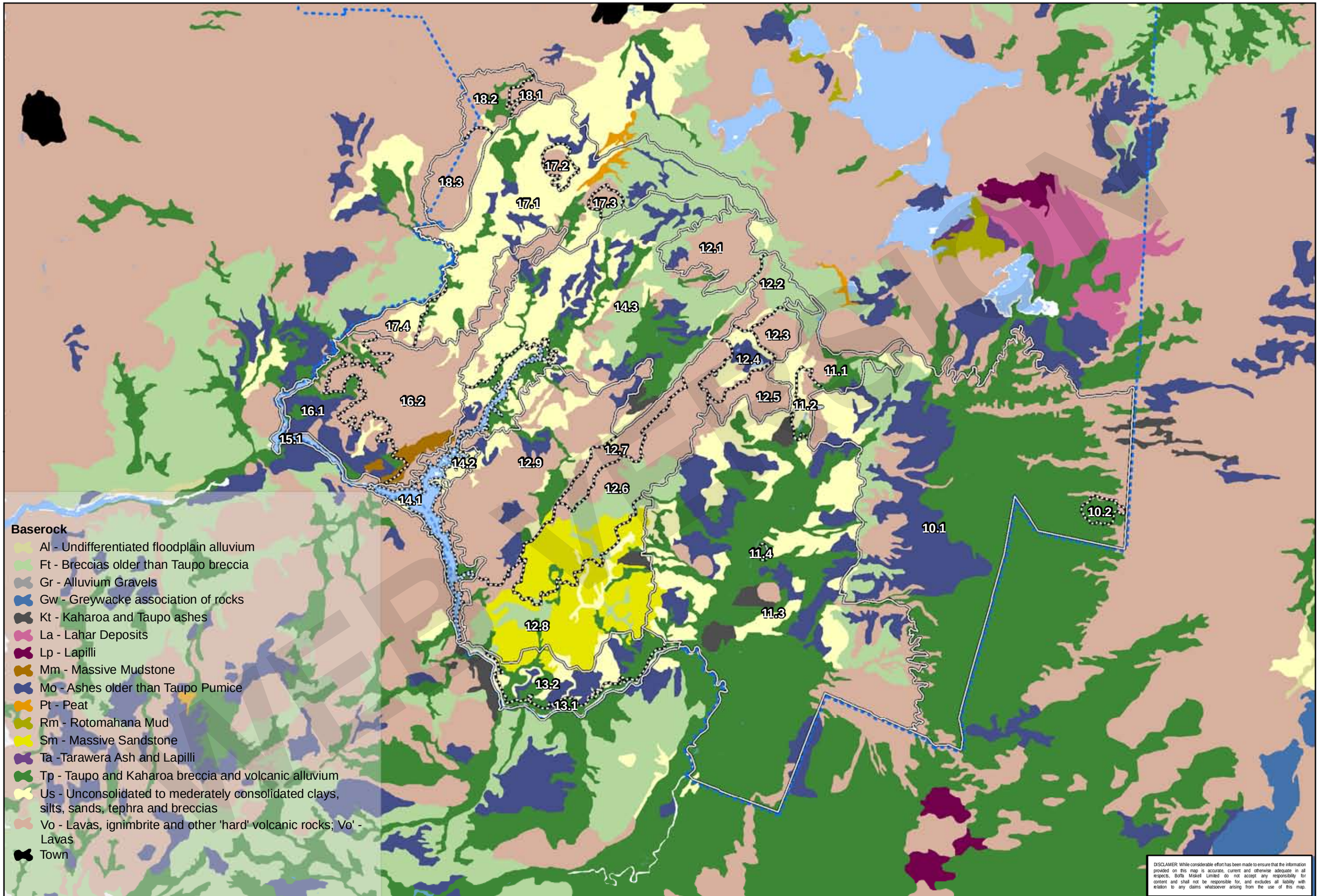

Map 5. Underlying Geology

Rotorua District Council Boundary
Landscape Character Area
Landscape Type
Lakes

Date: February 2009 Data Sources: Boffa Miskell Ltd, Landcare Research Ltd, New Zealand Land Resource Inventory (NZLRI) geology
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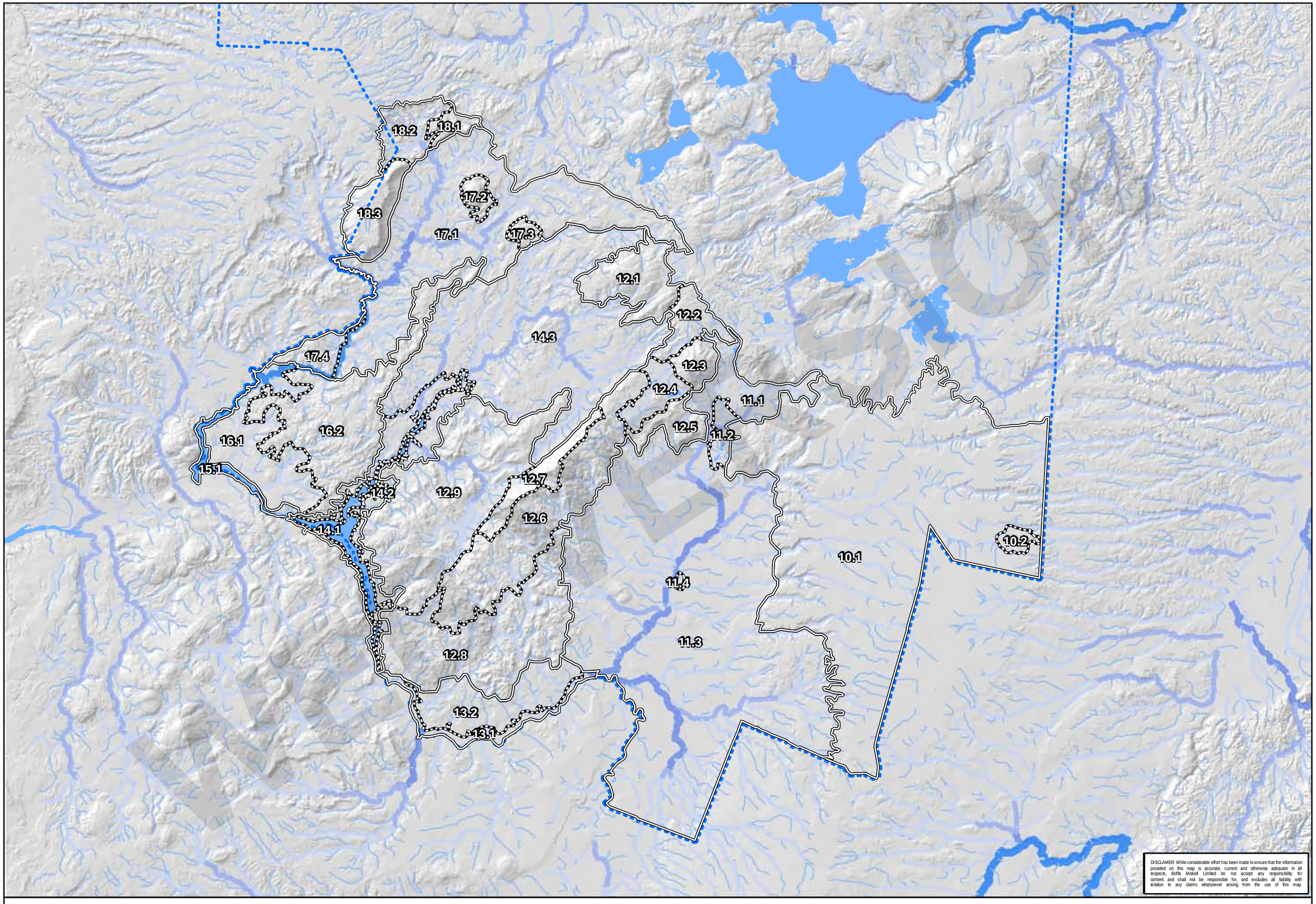

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Map 6. River Environment Classification of New Zealand

Rotorua District Council Boundary
Landscape Type
Landscape Character Area
Lakes
Stream Order 1 2 3 4 5 6

Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) lakes, National Institute of Water and Atmospheric Research (NIWA) River Environment Classification (REC) rivers
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17.2
18.3
17.1
17.3
12.1
12.2
14.3
17.4
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12.4
11.1
16.2
12.5
16.1
11.2
15.1
12.7
14.2
12.9
12.6
14.1
10.2
10.1
11.4
11.3
12.8
13.2
13.1

Landcover

- Matagouri
- Grey Scrub
- Afforestation (imaged, post LCDB 1)
- Afforestation (not imaged)
- Alpine Grass-/Herbfield
- Alpine Gravel and Rock
- Broadleaved Indigenous Hardwoods
- Built-up Area
- Coastal Sand and Gravel
- Deciduous Hardwoods
- Flaxland
- Forest Harvested
- Gorse and Broom
- Herbaceous Freshwater Vegetation
- High Producing Exotic Grassland
- Indigenous Forest
- Landslide
- Low Producing Grassland
- Major Shelterbelts
- Manuka and or Kanuka
- Mixed Exotic Shrubland
- Orchard and Other Perennial Crops
- Other Exotic Forest
- Pine Forest - Closed Canopy
- Pine Forest - Open Canopy
- River and Lakeshore Gravel and Rock
- Short-rotation Cropland
- Sub Alpine Shrubland
- Surface Mine
- Tall Tussock Grassland
- Transport Infrastructure
- Urban Parkland/ Open Space
- Dump
- River
- Lake and Pond

Map 7. Land Cover

Rotorua District Council Boundary Landscape Character Area

Landscape Type

Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) lakes, Landcare Research Ltd, Landcover Database 2 (LCDB2)

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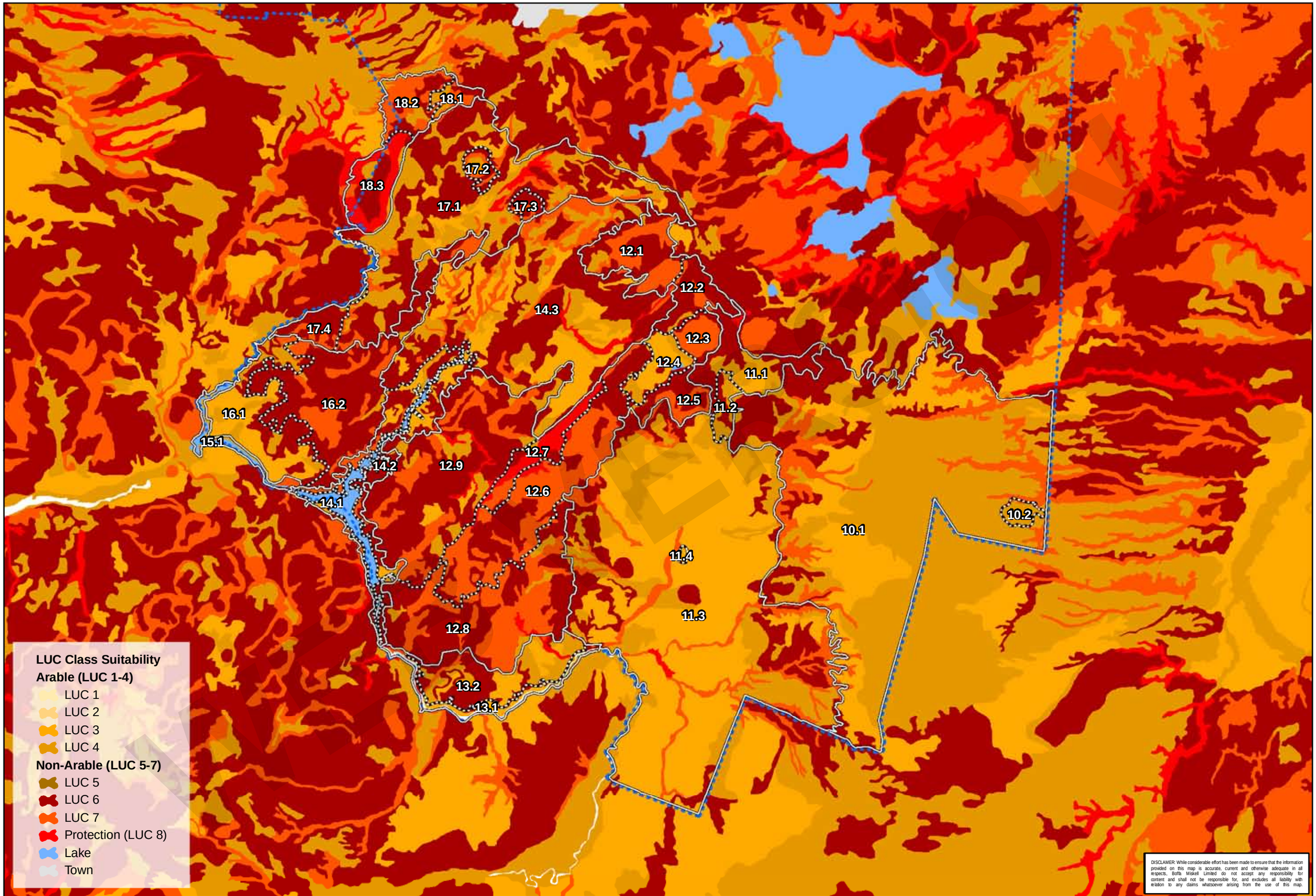

Map 8. Land Use Capability

Rotorua District Council Boundary Landscape Character Area

Landscape Type

Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) lakes, Landcare Research Ltd, Land Use Capability (LUC) as part of the New Zealand Land Resource Inventory (NZLRI) dataset

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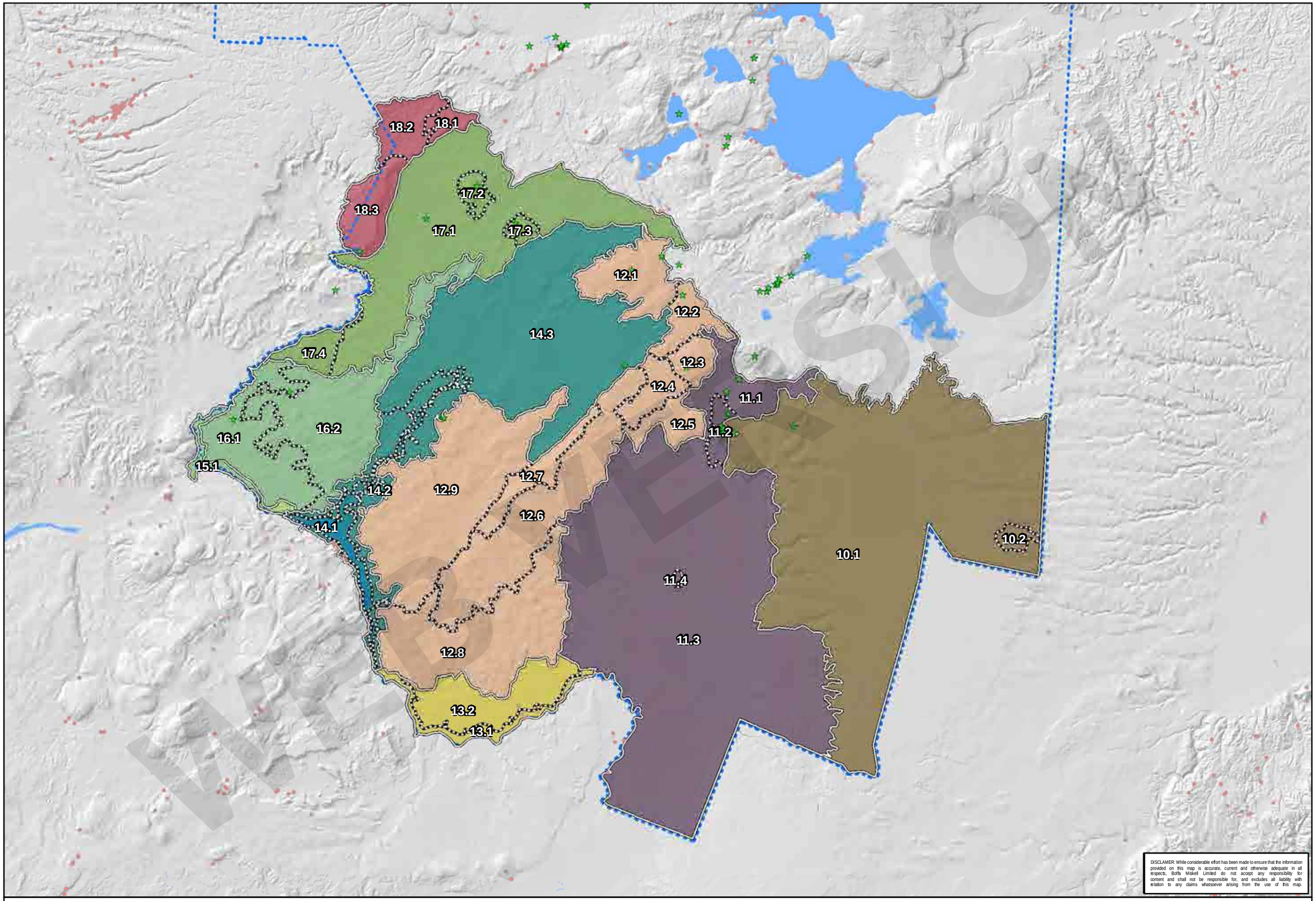

Map 9. Archaeological and Geopreservation Sites

Rotorua District Council Boundary
Landscape Character Area
Geopreservation Sites
Landscape Type
Lakes
Archaeological Sites

Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) lakes, Rotorua District Council Geopreservation Sites, New Zealand Archaeological Association (NZAA) Central Index of New Zealand Archaeological Sites (CINZAS)
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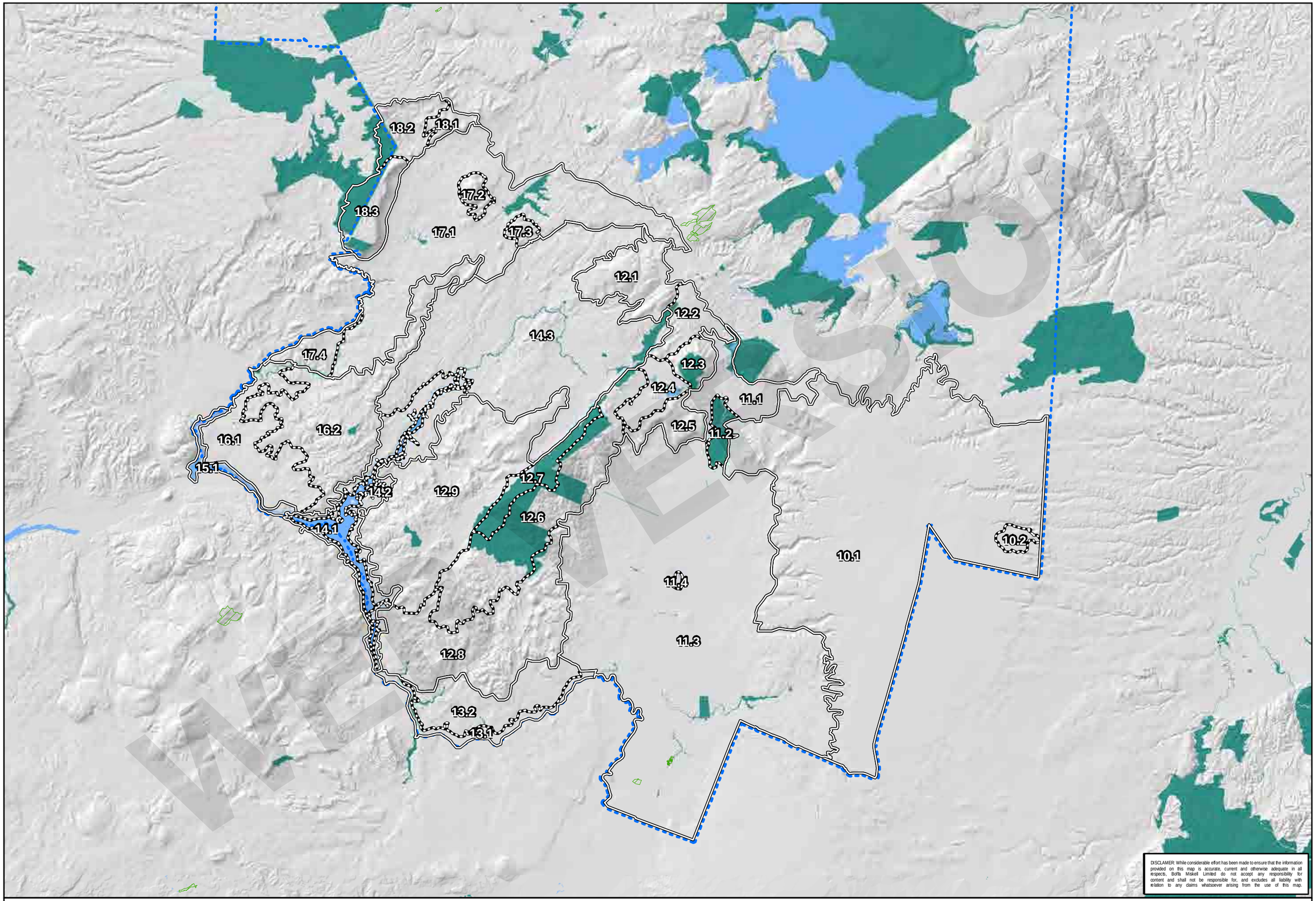

Map 10. Department of Conservation Units and QEII Covenants

Rotorua District Council Boundary
Landscape Character Area
Department of Conservation Units
Landscape Type
Lakes
QEII Covenants

Date: February 2009 Data Sources: Boffa Miskell Ltd, Land Information New Zealand (LINZ) lakes, Department of Conservation (DOC) Units, Queen Elizabeth II (QEII) Trust Covenants
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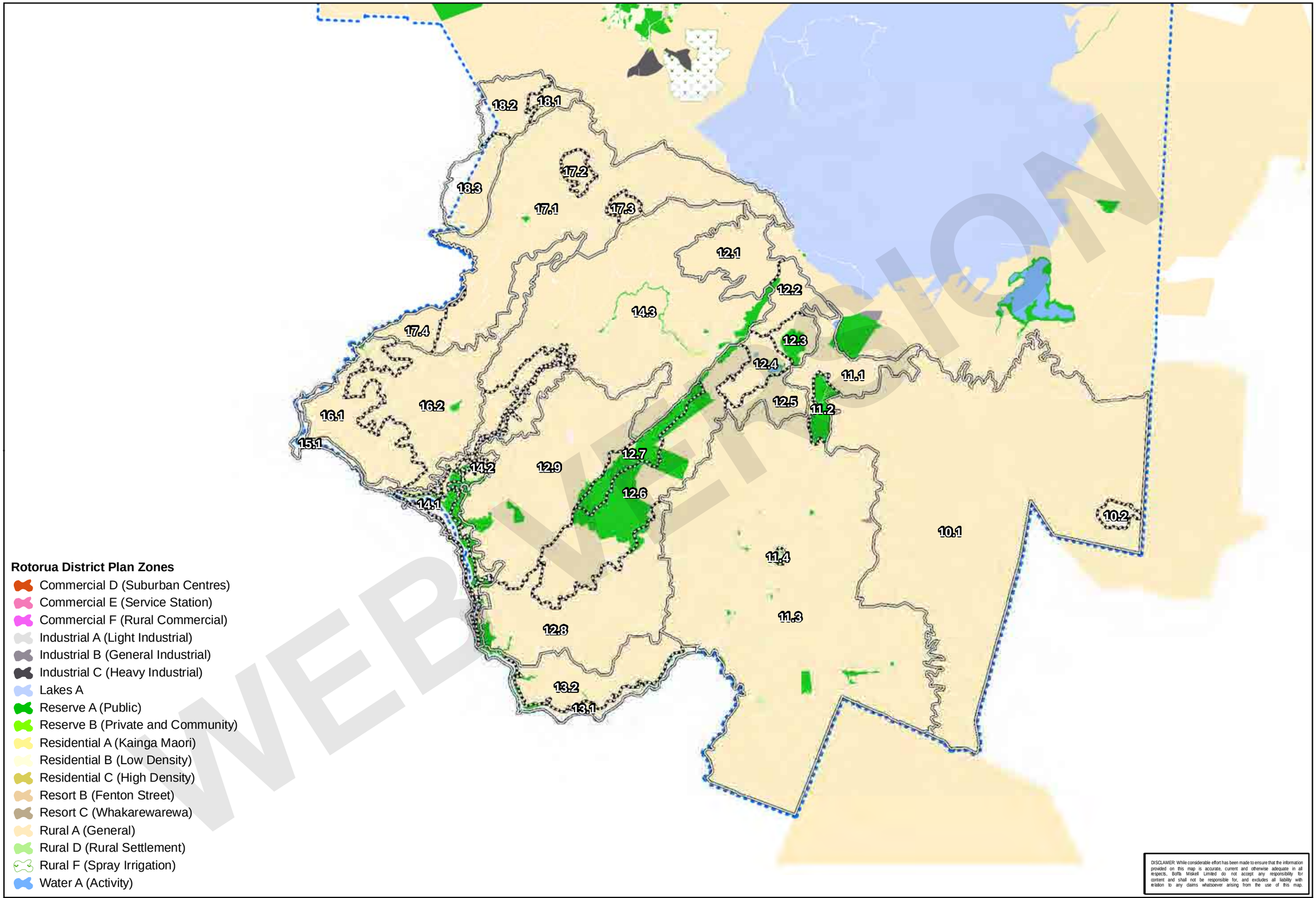

Rotorua District Plan Zones

- Commercial D (Suburban Centres)
- Commercial E (Service Station)
- Commercial F (Rural Commercial)
- Industrial A (Light Industrial)
- Industrial B (General Industrial)
- Industrial C (Heavy Industrial)
- Lakes A
- Reserve A (Public)
- Reserve B (Private and Community)
- Residential A (Kainga Maori)
- Residential B (Low Density)
- Residential C (High Density)
- Resort B (Fenton Street)
- Resort C (Whakarewarewa)
- Rural A (General)
- Rural D (Rural Settlement)
- Rural F (Spray Irrigation)
- Water A (Activity)

Map 11. Rotorua District Council Zoning

Rotorua District Council Boundary Landscape Character Area

Landscape Type

Date: February 2009 Data Sources: Boffa Miskell Ltd, Rotorua District Council Zoning

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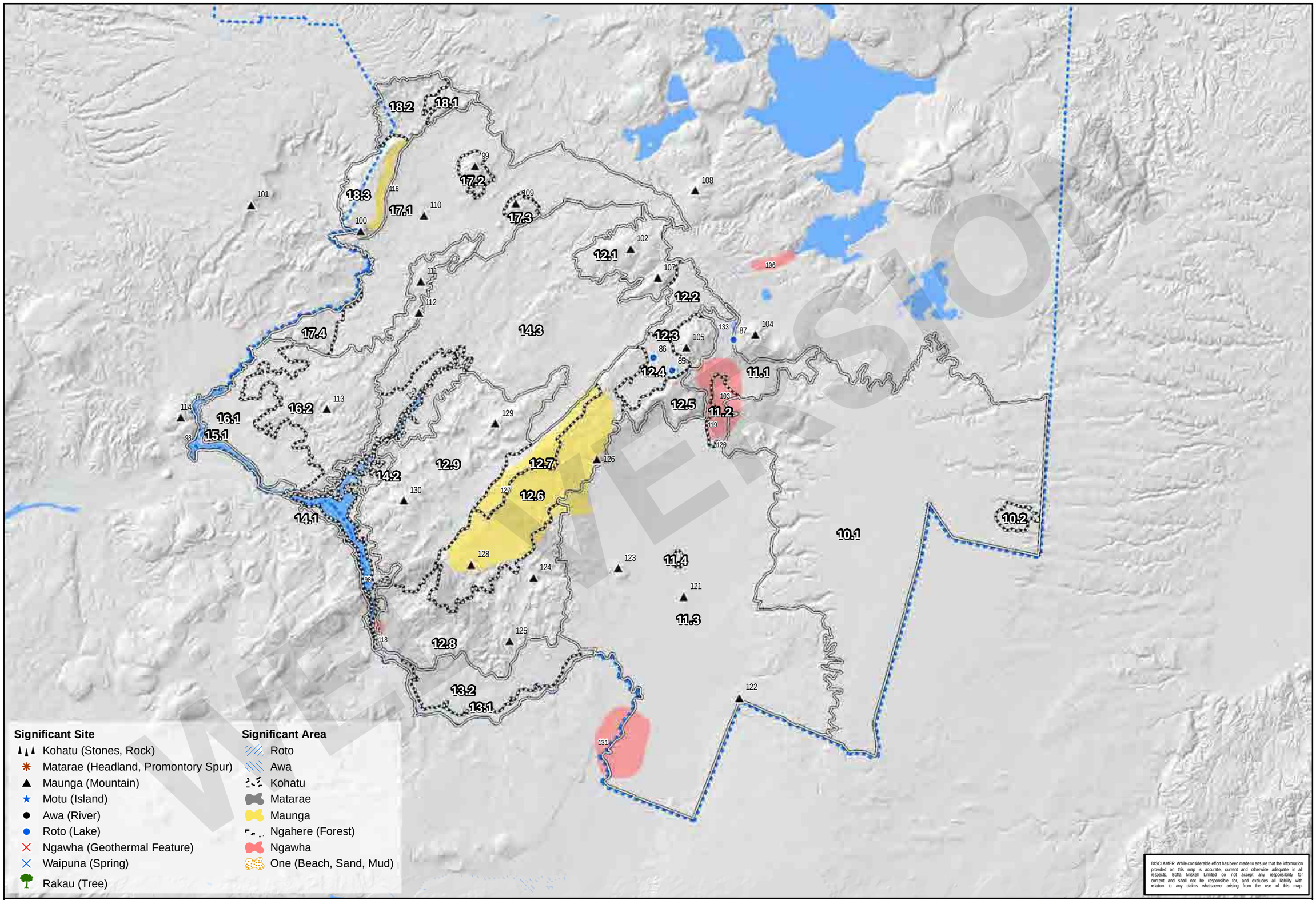

Significant Site

- Kohatu (Stones, Rock)
- Matarae (Headland, Promontory Spur)
- Maunga (Mountain)
- Motu (Island)
- Awa (River)
- Roto (Lake)
- Ngawha (Geothermal Feature)
- Waipuna (Spring)
- Rakau (Tree)

Significant Area

- Roto
- Awa
- Kohatu
- Matarae
- Maunga
- Ngahere (Forest)
- Ngawha
- One (Beach, Sand, Mud)

Map 12. Rotorua Cultural Landscapes

Rotorua District Council Boundary
Landscape Character Area
Landscape Type
Lake

Date: February 2009 Data Sources: Boffa Miskell Ltd, Cultural Landscapes, Land Information New Zealand (LINZ) lakes
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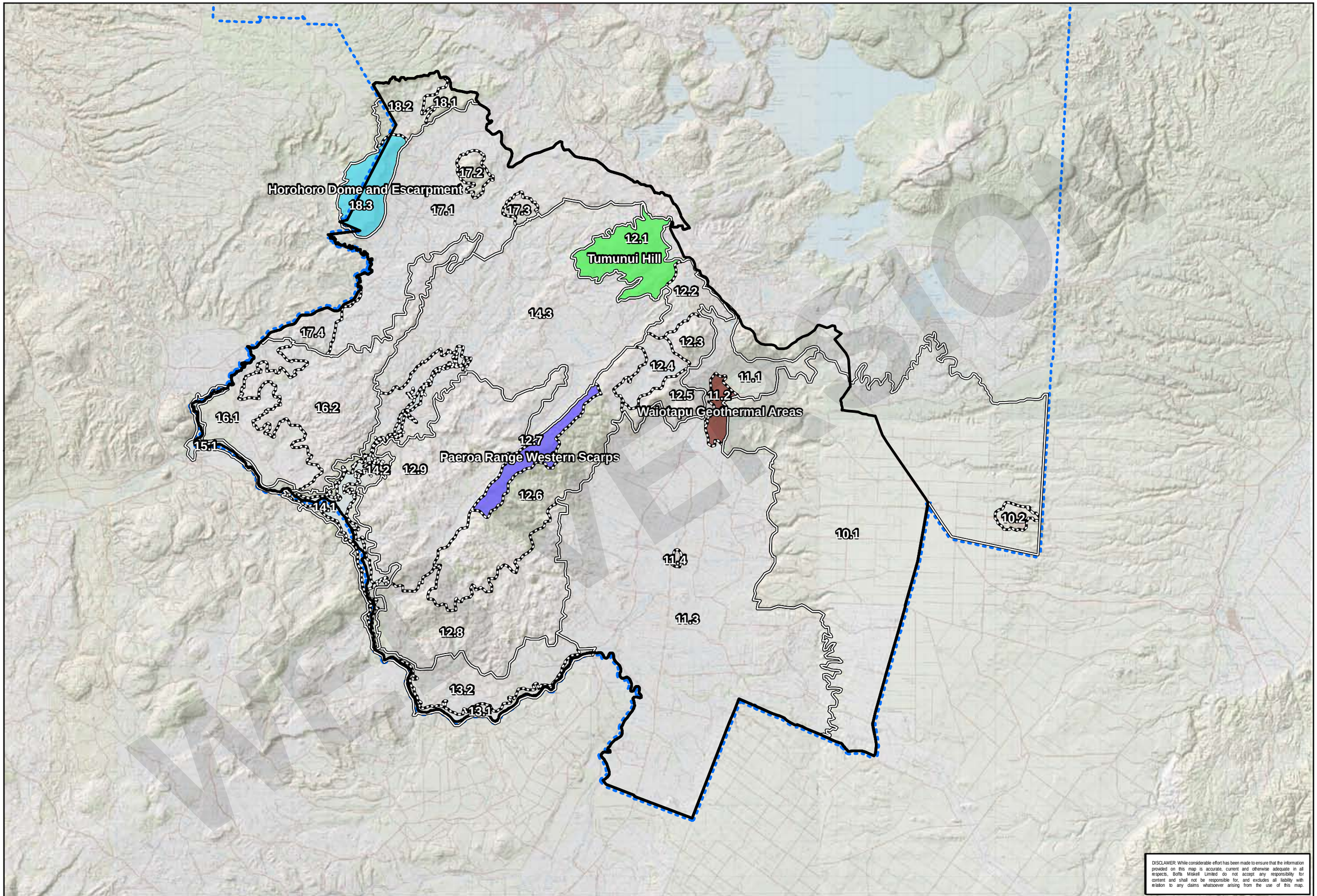

Map 13. Outstanding Natural Features and Landscapes

Rotorua District Council Boundary
Study Area Boundary
Landscape Type
Landscape Character Area

Date: February 2009 Data Sources: Boffa Miskell Ltd Landscape Types and Character Areas, Outstanding Natural Features and Landscapes (ONFL), Land Information New Zealand (LINZ) NZMS260
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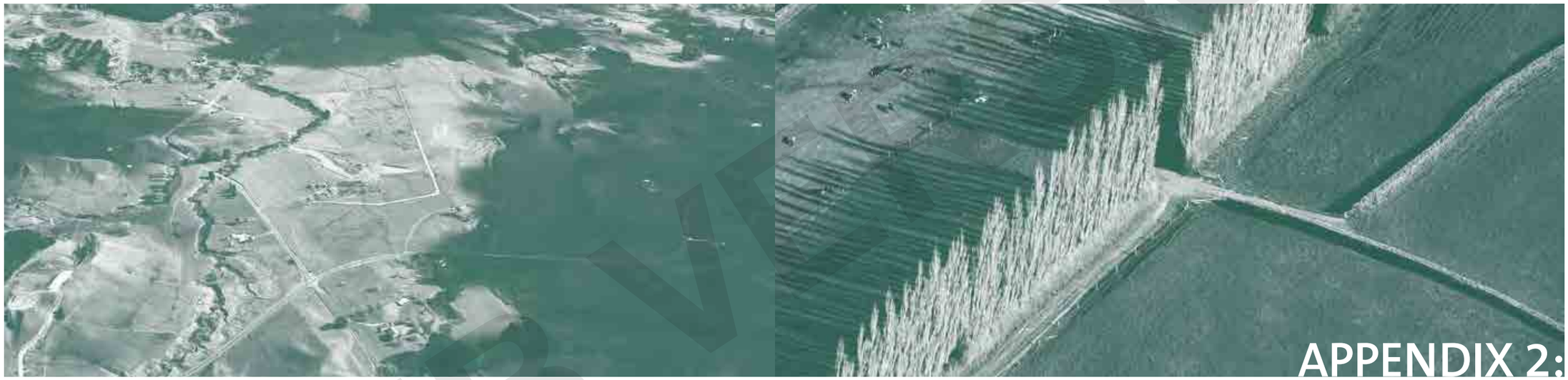


APPENDIX 2:
NEW ZEALAND LAND RESOURCE INVENTORY TERMS AND EXPLANATIONS

New Zealand Land Resource Inventory (NZLRI)

"The NZLRI is a spatial database containing similar information to that in the NZLRI worksheets. There are about 100,000 polygons (map units) within the NZLRI, each of which describes a parcel of land in terms of five characteristics or attributes (rock, soil, slope, erosion, vegetation). These are contained on about 400 worksheets or maps covering the whole of New Zealand. Scientists at Landcare Research are upgrading the vegetation component of the NZLRI using satellite images to identify where changes have occurred during the past 20 years or so. The NZLRI also contains very useful Land Use Capability (LUC) assessments for each of the polygons described.

Computerised Resource

New Zealand is fortunate in having access to the computerised New Zealand Land Resource Inventory (NZLRI). It is a powerful tool for managing land, planning resource use, or environmental research. The foundation layers of Landcare Research's GIS consist of physical resource information derived from the NZLRI.

The main features are:

1. An inventory of five physical factors controlling land use—rock, soil, slope, erosion and vegetation
2. Land Use Capability (LUC) assessments. These are shown as map units or land 'parcels' that are essentially uniform with respect to physical characteristics (i.e., the factors described in 1.).
3. Fundamental data layers (FDLs) which contain data for 16 key soil attributes for all New Zealand soils.
4. Pastoral and forestry production parameters, plus administrative and natural boundaries.

These allow comparative land use studies within a wide range of national or regional areas.

Land Use Capability Assessments

In addition to the inventory code described above, each map unit also contains a coded Land Use Capability (LUC) assessment of the land's capacity for sustained productive use taking into account physical limitations, soil conservation needs and management requirements. Land Use Capability assessment, while being extremely versatile in its applications, is only one of many interpretations that could be based on the land inventory information. This assessment should not be confused with recommended land use or present land use. The Land Use Capability assessment has three basic components—class, subclass and unit. Class is the most general, classifying land from I (the most versatile and productive class) to VIII (the class with most limitations to use). Subclass groups units with the same kind of limitation or hazard. Only the dominant limitation is recorded in symbol form on the worksheets, but other limitations are recorded in the land use capability extended legend. The four kinds of limitations recognised are

1. e erodibility
2. c climate
3. w wetness
4. s soil limitation within the rooting zone

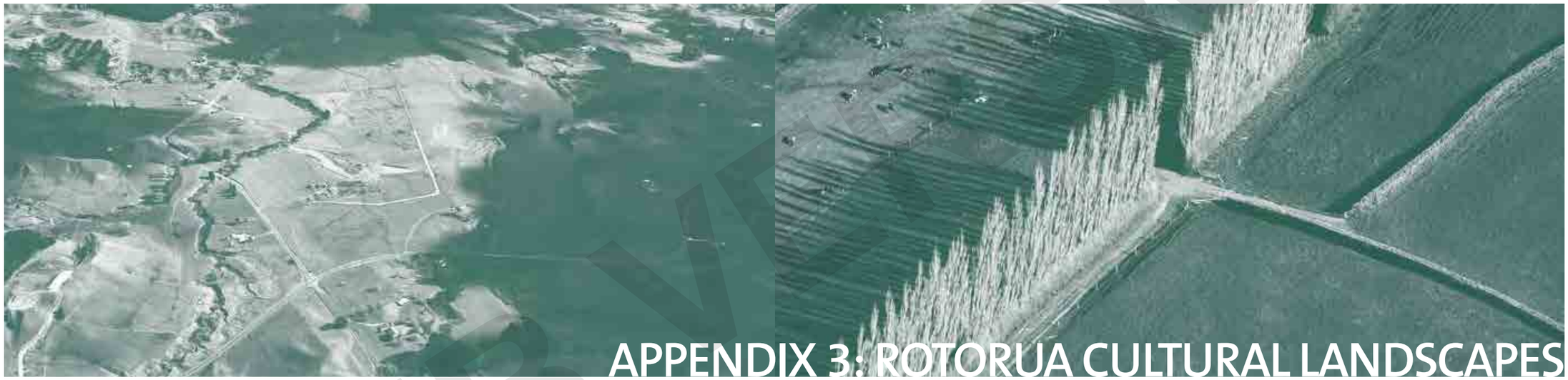
The Unit, which is represented by a number, indicates the particular LUC and denotes similar management and conservation requirements".

Slope

Slope is expressed in degrees in the following way:

0-3°	Flat to gently undulating
4-7°	Undulating
8-15°	Rolling
16-20°	Strongly rolling
21–25°	Moderately Steep
26-35°	Steep
>35°	Very Steep

Source: http://www.landcareresearch.co.nz/databases/nzlri.asp



APPENDIX 3: ROTORUA CULTURAL LANDSCAPES

The following list of natural features and landscapes of cultural significance to Maori has been sourced from a number of publications, statutory documents, legislation and mapping references. In particular Don Stafford's *Te Arawa (1967)* and *Landmarks of Te Arawa (1994/1996), Bateman Historical Atlas (1997),* the *Te Arawa Lakes Settlement Act 2006* and the *Waitangi Tribunal: He Maunga Rongo - Report on Central North Island Claims Wai1200 (2007)* have been used. These areas are mapped and can be found within the Study Area Resource Map Book: Map 12

Consultation with the Te Arawa Lakes Trust, Te Pumautanga o Te Arawa, local marae and the Te Arawa Standing Committee of Rotorua District Council, have provided verification, additions and valuable amendments.

The significance of cultural features and landscapes has been determined using a tiered scale of significant, highly significant and outstanding. Significant items have been identified by traditional name and are of local significance. Highly significant items have been identified by name, have an association with local hapu, specific ancestors and important events. Outstanding items are often associated with eponymous and founding ancestors of the iwi and hapu, important to the cultural identity and well-being of the iwi, well known and recognised.

Key

Awa	river, stream
Kohatu	rock, outcrop
Maunga	ancestral mountain, peak, range
Ngawha	hot spring or pool
Roto	Lake
Waipuna	freshwater spring

Ref	Traditional Name	Other Name	Category	Rating	Source
85	Ngapouri		Roto	Highly Significant	MS260-U16, Te Arawa Lakes Settlement Act 2006:Schedule 1 & 3
86	Tutaeinanga		Roto	Highly Significant	MS260-U16, Te Arawa Lakes Settlement Act 2006:Schedule 1 & 3
87	Rotowhero		Roto	Significant	MS260-U16
88	Pukemaire		Maunga	Outstanding	Stafford:1994:93,189
89	Tihi o Tonga		Maunga	Highly Significant	Stafford:1994:123,189
90	Morere		Maunga	Highly Significant	Stafford:1994:189
91	Karamu-takina		Waipuna	Highly Significant	Stafford:1994:189
92	Tangata-rua		Maunga	Highly Significant	Stafford:1994:189
93	Utuhina		Awa	Highly Significant	Stafford:1994:132,188,189
94	Papohatu		Kohatu	Outstanding	Stafford:1994:76-77,191
95	Matanuku		Kohatu	Highly Significant	Stafford:1967:37
96	Whangapipiro		Ngawha	Highly Significant	Stafford:1967:45
97	Hatupatu wishing rock		Kohatu	Outstanding	Stafford:1967:45, NZMS260-U16
98	Waikato		Awa	Outstanding	
99	Haparangi		Maunga	Outstanding	MS260-U16, Bateman:1997:plate20, Hui at Kearoa Marae:28.10.2007
100	Horohoro		Maunga	Outstanding	MS260-U16, Stafford:1967:43,65, Hui at Kearoa Marae:28.10.2007
101	Tikorangi		Maunga	Significant	MS260-U16
102	Tumunui		Maunga	Highly Significant	MS260-U16, Stafford:1967:442, Bateman:1997:plate20
103	Waiotapu		Ngawha	Highly Significant	NZMS260-U16, Waitangi Tribunal: He Maunga Rongo - Report on Central North Island Claims (Wai1200):2007:26,82,84,93
104	Maungakakaramea	Rainbow Mountain	Maunga	Highly Significant	Waitangi Tribunal: He Maunga Rongo - Report on Central North Island Claims (Wai1200):2007:76,77,92,119
105	Maungaongaonga		Maunga	Significant	NZMS260-U16, Bateman:1997:plate20
106	Waimangu		Ngawha	Highly Significant	NZMS260-U16
107	Waikorapa		Maunga	Significant	NZMS260-U16
108	Tutaeheke		Maunga	Significant	NZMS260-U16
109	Ongahoro		Maunga	Significant	NZMS260-U16
110	Waikaukau		Maunga	Significant	NZMS260-U16
111	Totara		Maunga	Significant	NZMS260-U16
112	Poutakataka		Maunga	Significant	NZMS260-U16, Bateman:1997:plate20
113	Ngapoipoiatore	Nga Poipoi a Tore	Maunga	Significant	NZMS260-U16, Bateman:1997:plate20
114	Ngautuku		Maunga	Significant	NZMS260-U16
115	Pohaturoa		Maunga	Outstanding	NZMS260-U17
116	Horohoro Cliffs	Te Horohoroinga o nga ringa o Kahumatamomoe	Maunga	Outstanding	NZMS260-U16, Stafford:1967:22, Waitangi Tribunal: He Maunga Rongo - Report on Central North Island Claims (Wai1200):2007:21,43,56,96
117	Kaikaitahuna	Hamurana Springs	Waipuna	Highly Significant	Stafford:1994:27-28,173, Te Arawa Lakes settlement Act 2006:Schedule 1
118	Orakei Korako		Ngawha	Highly Significant	NZMS260-U16
119	Ngakoro		Roto	Significant	NZMS260-U16
120	Orotu		Roto	Significant	NZMS260-U16
121	Pukekahu		Maunga	Significant	NZMS260-U17
122	Waimahunga		Maunga	Significant	NZMS260-U17
123	Kairuru		Maunga	Significant	NZMS260-U17
124	Pukemoremore		Maunga	Significant	NZMS260-U17
125	Pukepapataringa		Maunga	Significant	NZMS260-U17
126	Wharepapa		Maunga	Significant	NZMS260-U17
127	Paeroa		Maunga	Highly Significant	NZMS260-U17, Waitangi Tribunal: He Maunga Rongo - Report on Central North Island Claims (Wai1200):2007:76,77,78,89, Bateman:1997:plate20
128	Te Waro		Maunga	Significant	NZMS260-U17, Bateman:1997:plate20
129	Te Weta		Maunga	Significant	NZMS260-U17
130	Puaiti		Maunga	Significant	NZMS260-U17
131	Ohaaki	Te Ohaaki o Ngatoroirangi	Ngawha	Outstanding	NZMS260-U17, Stafford:1967:52,54, Bateman:1997:plate20, Waitangi Tribunal: He Maunga Rongo - Report on Central North Island Claims (Wai1200):2007:16
133	Ngahewa	Lake Ngahewa	Roto	Highly Significant	Te Arawa Lakes Settlement Act 2006:Schedule 1

APPENDIX 4: RURAL LAND USE MANAGEMENT RESOURCES

AGRESEARCH

www.agresearch.co.nz

Soil Characteristics Important to Management.

Information for farmers on soil characteristics to assist them manage their soil effectively: texture, structure, organic matter content, porosity and water-holding capacity and some aspects of chemical fertility and fertiliser management.

Vision - To be the pre-eminent organisation in New Zealand for promoting and enabling the sustainable management and development of the water environment

AGRIQUALITY

www.agriquality.co.nz

AgriBase

This is a national database or central index of farm ownership, location and management throughout New Zealand. It lists both agricultural and horticultural properties (around 100,000 in total), each with a unique identification code and links farm business units to land-based information. Through the creation of maps based on geographic information systems it has the capability for a wide range of uses.

BIODIVERSITY

Biodiversity New Zealand

http://www.biodiversity.govt.nz/index.html

This site provides information about Aotearoa New Zealand's native biodiversity, what is being done to help conserve and manage it, and who is involved. The information and work programmes covered in this site are part of New Zealand's long-term commitment to conserve its natural heritage under the New Zealand Biodiversity Strategy

The Department of Conservation and the Ministry for the Environment are working with Local Government New Zealand and other agencies to deliver a package of measures for protecting indigenous biodiversity on private land (i.e. areas outside public conservation lands), under the New Zealand Biodiversity Strategy (NZBS).

The package includes contestable funds to help land managers improve the condition of biodiversity on private land, with both advice and financial support. It also includes ensuring that the regulatory framework assigns responsibilities and supports the protection of biodiversity on private land.

To guide local bodies and land managers in their decision-making on land use and protection, there is a programme of guidance about biodiversity protection on private land.

Further guidance for resource management planners about indigenous biodiversity is available on the quality planning website.

CROP AND FOOD

www.crop.cri.nz/

Sustainable land and water use

We develop crop production systems to enhance productivity in balance with environmental needs. Clients need practical solutions that meet consumer expectations for health, safety and quality while minimising the impact of intensive use on our land, water and air.

We work with New Zealand's land-based industries to develop the knowledge and systems they need to make optimum use of their land and water resources.

The Sustainable Crop Production program

The aim was to produce Recommended Best Management Practices (RBMPs) for the production of process tomatoes, maize and sweet corn in the North Island of New Zealand.

Soil Quality Management System (SQMS)

SQMS is a decision-support system designed to help farmers monitor and manage changes in soil quality to enhance the productivity and environmental sustainability of mixed-cropping farms on the Canterbury Plains, New Zealand

www.crop.cri.nz/home/products-services/crop-production/sqms/index.htm

DAIRY FARMING

Fonterra

http://www.fonterra.com

Dairy Industry Strategy for Sustainable Environmental Management,

Pastoral Greenhouse Gas Research Consortium

Dairying and Clean Streams Accord

Fencepost.com

http://www.fencepost.com

Website for farmers includes weather forecasts and full access to farming information and services. Login and share your views and questions with other farmers from all around NZ - Discussion Groups Search more than 350 Fencepost Expert Farming articles in - Knowledge Base

Dexcel

http://www.dexcel.co.nz

Dairy Industry Strategy for Sustainable Environmental Management (2006)

A strategy put together by dairy farming leaders has created a way for New Zealand dairying to change its environmental impact while maintaining productivity.

Effluent Management

A Guide to Managing Farm Dairy Effluent - WAIKATO (2007)

This booklet for farmers provides the best management practices and regional rules for the main effluent systems currently operating in the Waikato.

Waterway Management

Bay of Plenty:

- Clean Streams
- A Guide to Managing Waterways on Bay of Plenty Farms.
- This booklet provides guidelines for managing waterways on farms in the Bay of Plenty Region.

Dairying and the Environment (DEC Manuals 2006)

These manuals contain fundamental information for the management of environmental issues on dairy farms in New Zealand. They have been designed to assist dairy farmers and those advising dairy farmers with practical, effective and safe solutions to manage potential environmental impacts. These manuals are intended to promote voluntary uptake of best management practices.

Riparian Management

Information on the set-up and management of riparian margins.

Planning an Effluent Treatment System.

Things to think about if you are planning a new effluent treatment system.

enviroDirect.

This is part of the Dexcel's Farm4Tomorrow programme. enviroDIRECT provides practical information resources on environmental issues faced on New Zealand dairy farms, and, can put you in touch with service providers operating in your region. Its aim is to provide simple and fast answers to any environmental. EnviroDIRECT is a FREE service is brought to you by Dexcel, with the support of the Ministry for the Environment, Dairy InSight, Environment Waikato, New Zealand Landcare Trust and Fonterra.

Land Application

Information regarding the set-up and management of the land application of effluent.

Limiting Pugging and Compaction Damage.

Management tips for the prevention of pugging and compaction damage.

DEERESEARCH

http://www.deeresearch.org.nz/index.asp

The New Zealand deer industry's major research website.

This website provides information on DEEResearch and, for registered users, allows unlimited access to hundreds of research papers and a large amount of other deer research information.

ENVIRONMENT BAY OF PLENTY

http://www.ebop.govt.nz

Dairy Effluent Deficit Irrigation Report

This guideline summary provides some help to farmers about what types of treatment and disposal systems would be appropriate dependant on the sensitivity of the receiving environment.
Included in the guidelines are other dairy farm activities that have potential to impact on the environment i.e. silage pits, calf-rearing facilities, and dairy feed pads/loafing pads.

Farm Dairy Fact Sheets

Environment Bay of Plenty produces fact sheets that relate to various areas of our responsibilities. These fact sheets provide information on specific topics and are very useful resources for Bay of Plenty residents.

- FD02 - Land based systems
- FD03 - Discharges to surface water
- FD04 - Feed pads, loafing pads and farm races
- FD05 - Silage stacks and bales
- FD06 - Disposal of waste milk

Land

- Land Monitoring
- Pest Animals
- Pest Plants
- Land Management
- Dairy Effluent
- Detention Dams and Drop Structures

Farm Dairy Fact Sheets

- Farm Tracks
- How to Plant
- Run off Pasture Management
- Shelter Belts
- Stream Crossings
- Willow Species Uses And Management
- Weed Control
- Woodlot Production
- Woodlot Species
- Stock Water Supply
- Revegetation Projects

Establishment techniques for revegetation projects.

Describes plant selection, site preparation, planting methods, fertiliser and post planting care for revegetation projects.

ENVIRONMENT WAIKATO

http://www.ew.govt.nz/

Waikato Farm Environment Awards Trust, 2003:

A Practical Guide to Low Impact Tracks and Races.

Waikato Farm Environment Awards Trust.

Trees on Farms

Planting trees gives many returns – financial, providing habitat for native species and creating a landscape we can all enjoy. The secret of successful results is to match the tree to the use and locality, and manage it in the right way.

'Trees on Farms: a guide with local experience of growing trees in the Waikato Region' covers a range of aspects of selection, establishment and care of trees on farms. It also includes comments and case studies from landowners who attended one of four 'Trees on Farms' workshops, sharing a range of different local experiences. You can view or print the report from this page in PDF file format.

http://www.ew.govt.nz/enviroinfo/land/treesonfarms.htm

Environment Waikato - River Management Guidelines

Good river management protects our property and land from damage

What to Plant in Maungatautari Ecological District

Environment Waikato local area planting guide series 1, Janice Amoore, Karen Denyer

Guide to Managing Farm Dairy Effluent

View the document on website

Areas of Significant Indigenous Vegetation and Habitats of Indigenous Fauna in the Waikato Region : Guidelines to Apply Regional Criteria and Determine Level of Significance

TR 2002/15, Karen Denyer, Wildland Consultants Limited

Clean Streams: A Water Body Enhancement Strategy for Environment Waikato

This document sets out proposals for the operation of a project to support the protection of water body margins in the Waikato Region. It sets out the background to the project, its objectives and priorities, and focuses in particular on its implementation. It is intended as a guide to Environment Waikato staff and Councillors to ensure that the project is consistently managed and as effective as possible in achieving improvements in the management of water body margins.

Environment Waikato Best Practice Guidelines for Waterways Crossings

(TR 2006/25, David Speirs, Greg Ryan)

31 page document

View the document on website

Managing Waterways on Farms

4 page booklet

Environmental indicators

Environment Waikato has environmental indicators that help tell us about the quality of, and any changes in, the Waikato region's environment.

LAND AND SOIL

- Biodiversity
- Land
- Soil

INLAND WATER

- Groundwater
- Lakes
- Rivers and Streams
- Wetlands

Map of River Management Catchments and Zones

Environment Waikato has divided the Waikato Region into nine river management catchments and zones. The scheme assets include conservation fencing, land retired from grazing use, plantings of trees and structures including bridges, erosion control flumes and crossings.

FERTRESEARCH

www.fertresearch.org.nz

Fertiliser Code of Practice.

The Code of Practice for Fertiliser Use is funded by the New Zealand Fertiliser Manufacturers' Research Association (NZFMRA) and promoted under the Association's brand name, Fert Research. It is an industry-wide document founded on the principles of sustainable land management. Its non-prescriptive approach provides for the safe, effective and responsible use of fertiliser on a site-specific basis.

The Code is intended to be a living document and it has undergone practical evaluation and review since its initial launch in 1998. In 2002 addenda were added to address issues and trends that had emerged in the four years since launch, and minor changes were made to incorporate new information into the Code document. The Code will continue to undergo practical evaluation and review by appropriate groups to ensure it remains relevant.

A training programme has been developed to ensure advisors and end users are provided with sufficient guidance in the use of the Code to achieve its objectives.

Applying Farm Dairy Effluent to Land

This information sheet highlights the benefits of applying effluent to land, the nutrients it contains and examples of how to calculate nitrogen loading rates and effluent application rates.

Nitrogen Fertiliser in Sustainable Farming.

Discusses the relationship between clover and nitrogen fertiliser, good practice for N applications and recommended rates of application.

NIWA

www.niwa.cri.nz

Guidelines for Constructed Wetland Treatment of Farm Dairy Wastewaters in New Zealand.

This document provides practical guidance on the use of constructed wetlands to improve the quality of discharges from farm dairy waste ponds.

SHMAK

The New Zealand Stream Health Monitoring and Assessment Kit

http://www.landcare.org.nz/SHMAK/index.html

This kit enables non-scientists to:

- collect consistent, scientifically valid information from small rural streams
- to use that information to make assessments of stream health

FORESTRY

NZ Forest Owners Assn (NZFOA)

www.nzfoa.org.nz

New Zealand Forest Owners Association - Environmental Research Database.

"The largest database of New Zealand forestry environmental literature ever compiled." The Forests Environmental Research Group has compiled a database of over 830 pieces of environmental literature and developed an invaluable resource for the New Zealand forest and related sectors. While primarily developed for forest industry managers involved in the resource management field, the New Zealand -specific information also has much wider application for consultants, local and central government, and other land based industries such as agriculture and mining.

The New Zealand Forest Accord

A commitment by forest companies and conservationists to value, protect and conserve New Zealand's indigenous forests. The Accord was signed in 1991 by representatives of four industry organisations and 10 conservation groups. It recognises the importance of commercial plantation forestry both as an economic activity and an alternative to the depletion of natural forests.

Forestry Stewardship Council

http://www.fsc.org/en/

FSC is an international not-for-profit membership-based organization that brings people together to find solutions to the problems created by bad forestry practices and to reward good forest management.

HORTICULTURE AND FOOD RESEARCH INSTITUTE OF NEW ZEALAND LTD (HORTRESEARCH)

http://www.hortresearch.co.nz/

HortResearch is a Government-owned world-class fruit science company. We use our unique resources in fruit, plants and environmentally sustainable production systems to produce innovative fruit and food products. We assist industry by developing innovative solutions and future plans.

Sustainable Land Use Research Initiative (SLURI)

http://www.sluri.org.nz/

Sustainable Land Use Research Initiative (SLURI)

A national centre for maintaining and managing our soils SLURI will:

- carry out research on the sustainable management of land
- develop new tools for regulators and land managers
- fully involve key stakeholders and other research organisations.

LAND CARE GROUPS (LAND CARE TRUST - ICM PROJECT)

http://www.landcare.org.nz/integrated_catchment_management

ICM aims to integrate the management of land, water and related biological resources in order to achieve their sustainable and balanced use. ICM brings together those involved in primary production, environmental conservation, land and water planning, research, environmental rehabilitation and other aspects of natural resource management at a catchment scale. ICM is based on a systematic effort to understand, through interpretation and analysis, the linkages between ecosystems, resources and people. It is a strategic approach to the management of environmental problems and involves the bringing together of a diversity of perspectives, disciplines and practices.

This is a Ministry for the Environment's Sustainable Management Fund project aimed at sharing community level best practice in Integrated Catchment Management (ICM) nationally.

This Ministry for the Environment Sustainable Management Fund project is aimed at sharing community level best practice in Integrated Catchment Management (ICM) nationally. The purpose of the project is to establish a network of Integrated Catchment Management practitioners and participants involved at the community level, and to provide opportunities for these people to share experiences, tools and approaches throughout New Zealand.

Landcare CRI

www.landcareresearch.co.nz

Protecting and Restoring our Natural Heritage - a Practical Guide

This guidebook provides information on protection, management and restoration of native ecosystems – why it is needed, how it can be done and where you can obtain further information. The material is presented in the order in which you need to proceed for any management or restoration project. Mark Davis – freelance ecologist and Dr. Colin Meurk – Landcare Research plant ecologist.

Land Information New Zealand

http://www.linz.govt.nz/home/index.html

LINZ holds authoritative information about land surveys and ownership, topographic maps and nautical charts. We make sure that the rating valuation system is fair and consistent and oversee the buying and disposal of Crown land.

SUSTAINABLE ADVANCING SUSTAINABLE MANAGEMENT SYSTEMS IN AGRICULTURE AND HORTICULTURE

http://www.samsn.org.nz/

Deer Farming

Deer Industry New Zealand

http://www.nzgib.org.nz

New Zealand Deer Farmers Landcare Manual

This document provides best management practices for New Zealand Deer Farmers. It includes information on management strategies to minimise negative environmental impacts e.g. erosion, water quality.

MEAT & WOOL NEW ZEALAND

http://www.meatnz.co.nz

MINISTRY OF AGRICULTURE AND FORESTRY

http://www.maf.govt.nz/mafnet/rural-nz/

The best means to achieve excellence in rural New Zealand...

- Sustainability
- Best practices
- Biodiversity
- Climate
- Irrigation
- Land
- Native forests
- Organics
- Resources
- Water

MAF - Sustainable Farming Fund.

The purpose of the Sustainable Farming Fund (the Fund) is to support projects that will contribute to improving the financial and environmental performance of the land-based productive sectors.

The Fund aims to help the land based sectors solve problems and take up opportunities to overcome barriers to economic, social and environmental viability. Funded projects are listed at this site.

Best Practice Dairying Catchments for Sustainable Growth.

This project is an initiative by the dairy industry to integrate environmentally safe practices into dairy farming. The project will encourage the adoption of best management practices that meet industry and regulatory authority requirements and address local issues.

Total Energy Indicators of Agriculture Sustainability

The aim of this study was to determine baseline data on total energy inputs, as indicators of the sustainability of the dairy production sector. Indicators were based on energy consumption, together with other indicators for land, water use, social effects and financial performance.

MINISTRY FOR THE ENVIRONMENT (MfE)

http://www.mfe.govt.nz/

State of the environment publications

http://www.mfe.govt.nz/publications/ser/index.html

Best practice guides and guidelines

Ministry for the Environment, 2001: Managing Waterways on Farms:

A guide to sustainable water and riparian management in rural New Zealand.

Best Practice Land Management Systems for Deer Farming.

The project is an initiative of the NZ Deer Farmers Association to produce a Landcare Manual to meet environmental responsibilities in deer farming. The aim is to be both simple and practical and describe best practice methods enabling deer farmers to meet any statutory, market and ethical requirements for the long-term environmental sustainability of their deer farming operations.

Landcare Resource Kit

Development and Distribution. MFE SMF funded project - To develop and distribute a landcare group resource kit. This will address the issues facing any person, group or agency trying to work collectively to address sustainable management of resources issues.

Ecological Footprint.

The Ecological Footprint is the total amount of land it takes to support a lifestyle. This is calculated on the basis of the products that a person consumes. This page provides background information on the concept and a model to calculate an individuals footprint.

Soil Conservation – Technical Handbook

This handbook provides best current practice in the field of soil conservation. June 2001,

Environmental Farm Plans

Environmental farm plans are used by a number of Regional Councils to encourage best environmental management practices on rural land.

- Waikato RC Environmental Farm Plans; Riparian Management Plans.
- Bay of Plenty RC Environmental Programmes.
- Hawkes Bay RC Soil Conservation Plans; Erosion Control Plans.
- Manawatu-Wanganui RC Environmental Plans.
- Taranaki RC Riparian Management Plans; Conservation Farm Plans; Agroforestry Farm Plans; Comprehensive Farm Plans.

Dairying and Clean Streams Accord.

In 2003 MAF, MFE, Fonterra and Local Govt NZ signed an Accord which aims to minimise the impact of dairying on New Zealand's streams, rivers, lakes and wetlands so that they are suitable, where appropriate, for fish, drinking by stock and swimming. The Accord specifies targets to keep dairy cattle out of streams, lakes and wetlands, to treat farm effluent, and to manage the use of fertilisers and other nutrients. Many of the implementation details will be fleshed out in regional action plans to be prepared by Fonterra and regional councils by June 2004.

Managing Waterways on Farms: A guide to sustainable water and riparian management in rural New Zealand.

This publication provides background information about the sources, causes and processes involved with the deterioration of streams in farmed catchments and the consequences of that deterioration. It is aimed at those who provide advice to farmers about how they manage their land, and to those farmers who wish to enhance their properties and reduce the impacts of their farming operations. July 2001, Ref. ME385

PARLIAMENTARY COMMISSIONER FOR THE ENVIRONMENT

http://www.pce.govt.nz/

The Parliamentary Commissioner for the Environment (PCE) aims to maintain and improve the quality of New Zealand's environment. The central focus is on environmental sustainability - how we can live within the ecological limits of the planet today and into the future.