

outstanding natural features and landscapes review

BAY OF PLENTY REGION

LANDSCAPE INDICATORS REPORT

Prepared for

ENVIRONMENT BAY OF PLENTY

by

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1.0 INTRODUCTION

Environment Bay of Plenty's brief to Boffa Miskell for updating and reviewing the outstanding natural features and landscapes (Resource Management Act Section 6(b) Matters of National Importance) within the region includes a request for advice in relation to the identification of indicators of landscape change through which ongoing monitoring of the outstanding natural features and landscapes (ONF&Ls) could be undertaken. The brief requires a review of the changes that have occurred to the ONF&L's between 1997 and 2006.

This report backgrounds a 'landscape indicators' project and makes recommendations for landscape indicators that could be adopted and applied to monitor landscape change within the ONF&L's of the Bay of Plenty. This excludes the coastal environment which was reported on separately and is to be found in a separate landscape indicators report for the Outstanding Natural Features and Landscapes of the Bay of Plenty Coastal Environment, (February 2006). In addition, Appendix I to this report sets out a tabular summary of the outstanding natural features and landscapes of the region and identifies particular 'enhancer' and 'detractor' change identified during the desk top (aerial photography comparison), between 1997 and 2003 and field survey work undertaken by Boffa Miskell.

2.0 RELATED PROJECTS

Boffa Miskell has previously undertaken related projects to assist in the identification of landscape indicators and in the development of methodologies, at a District level, to monitor landscape change in identified ONF&Ls. A brief description of two such related projects is set out below, following which we make recommendations to Environment Bay of Plenty in relation to suitable indicators of landscape change – both beneficial and adverse – that could be adopted and implemented to enable Environment Bay of Plenty to incorporate landscape monitoring within the region's state of the environment monitoring and reporting processes.

2.1 Tauranga District Council

State of the Environment Monitoring Programme

Outstanding Natural Features and Landscapes, March 2000 (Boffa Miskell)

Boffa Miskell undertook a district-wide assessment of the Tauranga Local Authority area in 1995 included in which was the identification of Outstanding Natural Features

and Landscapes (ONF&Ls). During 1999/2000 the District sought to establish a methodology to monitor change, both adverse and beneficial, in the ONF&Ls as part of its overall duty to monitor the state of the environment (Section 35 RM Act). That Council's brief for the development of a monitoring methodology required that the monitoring programme be able to be undertaken by "non-expert" individuals (i.e. those with no particular landscape architectural or landscape appreciation training or experience).

The methodology developed centred on the identification of activities that have the potential to either adversely affect (detractors) or benefit (enhancers) the qualities of the ONF&Ls, recognising at the same time that landscapes are complex dynamic systems and that there is little purpose in recording their every change in detail. What was needed was a methodology and indicators that would enable the District Council to monitor significant dramatic or incremental change that affected the overall core values of the ONF&Ls, the overriding purpose being to monitor whether the District Plan objectives, policies and rules were providing appropriate protection for the District's identified ONF&Ls.

The following extract from the "Procedures Manual" report describes the nature of landscape detractors and enhancers.

"Landscapes can be affected both adversely (by detractors) and positively (by enhancers). Detractors can be defined as those elements that interfere adversely with the visual character and quality of the landscape, while enhancers are those elements that improve character and visual quality. Both detractors and enhancers can be either natural or cultural activities or occurrences. Along the Tauranga Harbour coastline enhancers are frequently natural such as remnant vegetation, particularly pohutukawa, although some historical features may also enhance the visual experience of the coastline.

Detractors are generally culturally induced and include landuse patterns that are visually dominant and not in harmony with the natural pattern of the landform, earthworks that create visual scars and introduce unnatural landscape elements, as well as built elements that (by their scale, form or location) are incongruous within the surrounding (natural) landscape. Cultural elements tend to form either enhancers or detractors dependent on their location. It is not so much the element itself that enhances or detracts but the

visual combination of the element with its location and specific setting. The same type of cultural element placed in a different context may have an entirely different visual effect.

To enable a monitoring programme to be put in place the expected range of possible landscape enhancers and detractors within Tauranga District have been identified according to their landscape category (i.e. landform, vegetation, cultural). The specific types of activity that would adversely or beneficially affect each of these categories have also been defined. These are shown in Table 1.

Table 1 : Example of Field Card Showing Landscape Categories and Activity Types

Detractor Field Card For All Outstanding Landscapes

Category	Activity	Detractor Type	Scale	Impact	Score
			(0 – 5)	(0 – 10)	
Landform	Earthworks				
	Structures				
	Dumping				
Vegetation	Clearance				
	Weed Infestation				
	Browsing Damage				
Cultural	Physical Damage				
Other					
This Years Score					

Note: Both detractor and enhancer field cards are included in the field recording methodology.

Different detractors and enhancers that occur within any outstanding landscape will not be equal in terms of their effect on landscape values. These differences are a function of the respective visibility, vividness, context and scale of the effect. These four aspects of change are inter-related and are not entirely separated from each other. It is the combination of all four aspects that produces the overall impression of change in a landscape. The

four aspects of change operate in combination to generate a combined visual impact or effect. This is discussed in more detail below.

5.1 Scale or Magnitude

One of the key component elements in evaluating the effect of an activity (beneficial or adverse) on an outstanding landscape is that of scale. This measure refers to the magnitude or size of the activity that has altered the visual values of an outstanding landscape. Scale is based on the spatial extent of change and therefore not only allows an assessment of the relative impact of a new activity but also assists in distinguishing between the significance of different types of change within an outstanding landscape.

5.2 Impact

In addition to the scale the second factor that is 'scored' to record the effect of an activity on the values of the outstanding landscape is impact. Impact can be determined based on a combination of the elements of visibility, vividness and context.

5.2.1 Visibility

Visibility refers to the degree to which the landscape is viewed either by a static residential population or by mobile viewers (i.e. those either on roads, on the sea or at public viewing places).

As an example of the ways in which visibility effects perceived landscape change, earthworks on a highly visible landform (e.g. Mangatawa) would be more visible than a similar size reclamation just above the waterline within Tauranga Harbour. Such reclamation would itself be more visible than in similar sized earthwork in a remote part of the Wairoa floodplain located away from roads and residential properties. Notwithstanding the above it is important to keep in mind that landscapes that are not frequently seen are still sensitive to change, and that these should also be carefully managed to protect and enhance their landscape quality. An activity that causes adverse landscape and visual effects that is only seldom seen will still generate those landscape effects but the degree of visual impact will be reduced by its limited visibility.

5.2.2 Vividness

Vividness is a reflection of how memorable the impact of a change is in a landscape. For example, the clearance of native bush from Mauao would be a more vivid impact than if an area of saltmarsh was cleared from the harbour. Both are adverse landscape effects, but the former is a more 'vivid' change, generating greater impact.

5.2.3 Context

Context refers to the relative location of a change and its relationship to its immediate environs. Determining the context involves an assessment of the degree of divergence away from (or toward) the previously existing visual state.

The degree of impact of an activity in relation to its context relates to whether or not harmony has been maintained. Harmony is achieved by way of integration with the existing or natural qualities of the landscape. Often it is the naturalness and/or modification of the surrounding landscape in relation to the new activity that is critical to this assessment. For example, new wharves will have a reduced adverse visual effect if they are constructed within an existing port zone than if they were constructed in a pristine area of coastline. Similarly several new houses located within an outstanding landscape would have less impact if they were associated with existing development rather than being in an area presently devoid of such structures.”

The Tauranga ONF&L monitoring methodology employs a simple system of scoring the impact of landscape change with the trend of change over time able to be monitored. In this way, incremental adverse and/or beneficial change can be “observed” as well as more dramatic single event alteration to the values of the ONF&Ls recognised.

The final loop in the monitoring of change to the ONF&Ls is to review the District Plan objectives, policies and rules to determine whether these are providing adequate protection of these important landscapes and features, whether enhancement is being promoted and what if any amendments to objectives, policies and rules may be required to ensure the desired environmental outcomes –

protection and enhancement of ONF&Ls as a matter of national importance – are being achieved.

2.2 Environment Bay of Plenty Heritage Criteria

In addition to the above background project Environment Bay of Plenty has recently developed a set of criteria for the determination of the significance of landscape. These criteria, listed below, provide the framework for the identification of outstanding natural features and landscapes within the regional and draw from both practitioner usage / experience and the direction of the Environment Court.

Set 2 *Natural Features and Landscapes*

Policies 15.3.1(b)(iv), 15.3.1(b)(vii), 15.3.1(b)(xii)

Methods 15.3.1(c)(i), 15.3.1(c)(xii)

Natural Science Factors

Representativeness

- 2.1 *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 in essence;*
- 2.2 *Natural features in a good state of preservation are representative and characteristic of the natural geological processes and diversity of the region;*

Research and Education

- 2.3 *Natural features and landscapes are valued for the contribution they make to research and education;*

Rarity

- 2.4 *Natural features are unique or rare in the region or nationally, and few comparable examples exist.*

Aesthetic Values

Coherence

2.5 *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

2.6 *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;*

Naturalness

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

Intactness

2.8 *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;*

Expressiveness (Legibility)

2.9 *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;*

Transient Values

2.10 *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;*

Shared and Recognised Values

2.11 *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;*

Maori Values

2.12 *Natural features and landscapes are clearly special or widely known and influenced by their connection to the Maori values inherent in the place;*

(Refer also to set 4 - Maori Culture and Traditions criteria).

Historical Associations

2.13 *Natural features and landscapes are clearly and widely known and influenced by their connection to the historical values inherent in the place;*

(Refer also to set 5 - Historic Heritage criteria).

3.0 RECOMMENDATION IN RELATION TO INDICATORS FOR MONITORING LANDSCAPE CHANGE TO ENVIRONMENT BAY OF PLENTY'S OUTSTANDING NATURAL FEATURES AND LANDSCAPES

The project to review the originally identified ONF&Ls within the Bay of Plenty Region (1997 report) has provided a context for understanding the nature of landscape change occurring within and around the outstanding natural features and landscapes.

In very broad terms, the nature of landscape change in the intervening 9 years within the identified outstanding natural features and landscapes has been limited. Any change has not tended to impinge on the identified ONF&Ls in such a way as to detract from the core values of any one ONF&L sufficiently to require redefinition of boundaries or the deletion of an ONF&L. Generally the changes have occurred outside the boundary, or within the context of those ONF&Ls defined and delineated in 1997.

These changes can be summarised as follows

- Expansion of existing quarrying
- Forestry harvesting and replanting
- New access tracks
- Additional dwellings and structures
- Vegetation clearance

In addition, there has been a limited amount of shrubland regeneration.

Having observed the nature of landscape change occurring in the landscape as part of the review project, the possible indicators for monitoring landscape change in the identified ONF&Ls would appear to logically comprise detractors and enhancers in relation to:

- landform;
- land cover;
- structures; and
- utilities / infrastructure.

The following table suggests a methodology for recording the beneficial and/or adverse changes to any ONF&L as a result of changes in the five areas of potential landscape change identified above.

Outstanding Natural Feature and Landscape: name and reference		
Agent of landscape change	Detractor Type	Enhancer Type
Change to landform	- Earthworks - Reclamation - Quarrying / borrow areas	- Recontouring - Declamation - Landform restoration
Change to waterform	- Drainage of wetlands - Engineering works to river mouths	- Wetland creation - Natural protection works
Change to vegetation cover	- Vegetation clearance - Predominance of exotic weed species - Artificial patterns of vegetation unrelated to landform	- Natural regeneration - Assisted revegetation
Change to Structures	- New urban development with structures dominant - Individual large buildings dominant	- Reduced dominance of development
Change to Infrastructure	- Prominent new power lines, telecommunications facilities, roading	- Removal or reduced dominance of infrastructure

In summary, therefore, the recommended indicators for monitoring landscape change – both beneficial and adverse – are change in relation to landform, waterform, vegetation cover, structures and infrastructure.

Having identified potential indicators for monitoring landscape change – beneficial and adverse – a methodology for regularly assessing change and the overall trend of this in

relation to the ONF&Ls of the region is the next step to the implementation of state of the environment monitoring for the ONF&Ls. Such methodology needs to avoid “double counting” and enable review back to the objectives and policies of the Regional Policy Statement to determine the success of those policies in affecting the protection and enhancement of the identified outstanding natural features and landscapes. The development of a methodology for monitoring landscape change within the ONF&L’s of the Bay of Plenty does not form part of this brief however matters for consideration and determination include:

- a) *Time interval: How frequently should landscapes be monitored for change?* An interval of less than 2 years is unlikely to be sufficient for real change to be perceptible whilst an interval of greater than 5 years becomes too long should action be required to reverse undesirable change. A period of between, 3 and 5 years is recommended balancing the resources needed to undertake the monitoring project, the likelihood for landscape change (beneficial or adverse) and the potential for policy changes to be implemented to address issues where significant adverse landscape change affecting ONF&L’s is occurring.
- b) *Who should undertake the monitoring?* Methodologies can be developed for monitoring landscape change that can be implemented either by ‘expert’ landscape architects familiar with observing and recording landscape change or by lay people using a more prescriptive methodology with less requirement for interpretation. A requirement of the brief for the Tauranga District (as it then was) landscape indicators methodology was that once developed and the baseline established any lay individual, independent of a background in landscape architecture, could undertake the ongoing monitoring.
- c) *How is observed landscape change (beneficial or adverse) related back to policy?* This step will require interpretation and the likely input of specialists both in the fields of landscape architecture / landscape planning and in statutory planning. The review of resource consent conditions or the background to factors enabling landscape change is likely to be required as well understanding of non statutory initiatives such dune care enhancement or assistance with vegetation protection.

Attached as Appendix 1 to this report are tables recording identified change between 1997 and 2006 in the outstanding natural features and landscapes observed as part of the review

project. This does not include those features and landscapes previously identified in 1997, but excluded following the 2006 review. This is due to the fact that they were not excluded for reasons associated with landscape change, but rather that they did not meet the criteria established in relation to assessing whether the natural features and landscape are outstanding. This is explained in more detail in the accompanying report “Bay of Plenty Region; Outstanding Natural Feature and Landscape Review – June 2007”

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APPENDIX 1

Tables recording observed landscape change in ONF&L's

Note 1: The tables and related maps for outstanding natural features and landscapes are numbered consecutively from ONFL 47 to ONFL 82, followed by the original identifier number from the Bay of Plenty Heritage sites: Outstanding Natural Features and Landscapes, (November 1997).

Note 2: The outstanding natural features and landscapes (ONF&L's) recorded in this document are those which were identified in the Bay of Plenty Region Outstanding Natural Features and Landscapes Review, (November 2006).

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Kaimai Ranges and Foothills

ID number: 47 (10)

District: Western Bay of Plenty/Rotorua

General change since 1997: No detractors or enhancers were identified for this site – due to no visibly apparent changes since 1997. Possible additional forest edge landscape change with rural residential development and forestry in Kaimai foothills areas.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Kaimai Mamaku State Forest and Foothills

ID number: 48 (29)

District: Western Bay of Plenty/Rotorua

General change since 1997: Ongoing commercial forestry operations on and near forest edges.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover	Ongoing forestry rotations on forest edges.	
Change in Structures		
Change in Infrastructure		

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Ottawa-Otanewainuku-Wharetetarakehe Forest Uplands

ID number: 49 (19 & 21)

District: Western Bay of Plenty

General change since 1997: Ongoing commercial plantation forestry operations and localised quarry operations.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform	Ongoing quarry operations.	
Change in Waterform		
Change in Vegetation Cover	Forestry block south of McPhail Road.	
Change in Structures		
Change in Infrastructure		

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Mangatawa and Upuhue

ID number: 50 (37)

District: Tauranga

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Papamoa Hills

ID number: 51 (18)

District: Western Bay of Plenty

General change since 1997: Ongoing rural residential development and quarry activity.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform	Ongoing quarry activity on eastern boundary.	
Change in Waterform		
Change in Vegetation Cover	Limited removal of windbreaks for pastoral land uses.	
Change in Structures	Residential dwellings evident in elevated north facing foothill areas.	
Change in Infrastructure	Access tracks / roading to additional elevated north facing knolls and ridges.	

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Bay of Plenty Region – Outstanding Natural Features and Landscapes Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes		
ONF&L name: Ngongotaha		
ID number: 52 (39)	District: Rotorua	
General change since 1997: Ongoing vegetation cover change on the northern area boundary with limited residential development near Pleasant Heights to the south.		
CATEGORY	DETRACTOR	ENHANCER
Change in Landform	Ongoing quarry activities in the north east.	
Change in Waterform		
Change in Vegetation Cover	Forestry rotation - harvesting and replanting. Some shrubland successional processes apparent on the northern scarp boundary.	
Change in Structures	Limited residential development on southern foothills areas.	
Change in Infrastructure		

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rotorua

ID number: 53 (40)

District: Rotorua

General change since 1997: Limited residential lake edge development and surrounding rural residential development.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover		
Change in Structures	Residential dwellings particularly near Hamurana.	
Change in Infrastructure		

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Mokoia Island

ID number: 54 (41)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Rotorua Caldera Rim Remnant

ID number: 55 (47)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Whakarewarewa Geothermal Area

ID number: 56 (42)

District: Rotorua

General change since 1997: Ongoing commercial development of tourist facilities.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover	Limited vegetation clearance near carpark.	
Change in Structures	Commercial building development.	
Change in Infrastructure	Carpark and facilities development.	

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rotoiti and surrounds

ID number: 57 (46)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Tikitere Thermal Area

ID number: 58 (44)

District: Rotorua

General change since 1997: Removal of plantation forestry in areas immediately adjoining site.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform	Surface activity on/adjacent to the northern boundary.	
Change in Waterform		
Change in Vegetation Cover	Removal of plantation forestry.	
Change in Structures		
Change in Infrastructure		

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rotokawau

ID number: 59 (45)

District: Rotorua

General change since 1997: Limited change in structures.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover		
Change in Structures	Some incomplete commercial development on north western border.	
Change in Infrastructure		

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Okataina

ID number: 60 (45)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Okareka

ID number: 61 (50)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rotokakahi (Green Lake)

ID number: 62 (49)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Tikitapu (Blue Lake)

ID number: 63 (49)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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Bay of Plenty Region – Outstanding Natural Features and Landscapes Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes	
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ONF&L name: Lake Tarawera – to be assessed 19 Sep 2006.	
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ID number: 64 (45)	District: Rotorua
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General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.	
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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Makatiti Dome

ID number: 65 (45)

District: Rotorua

General change since 1997: No significant change identified – limited forestry planting.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover	Limited plantation forestry planting in the north east.	
Change in Structures		
Change in Infrastructure		

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Bay of Plenty Region – Outstanding Natural Features and Landscapes Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes		
ONF&L name: Mount Tarawera		
ID number: 66 (45)	District: Rotorua	
General change since 1997: No significant change identified.		
CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover	Plantation forestry rotations on area boundary.	
Change in Structures		
Change in Infrastructure		

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Bay of Plenty Region – Outstanding Natural Features and Landscapes Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes	
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ONF&L name: Lake Rotomahana	
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ID number: 67 (45)	District: Rotorua
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General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.	
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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Waimangu Geothermal Area

ID number: 68 (45)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Rainbow Mountain - Maungakakamea

ID number: 69 (New)

District: Rotorua

General change since 1997: No apparent change identified (from 1998 aerials).

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rerewhakaaitu

ID number: 70 (54)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rotoehu and surrounds

ID number: 71 (46)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Lake Rotoma and Caldera

ID number: 72 (55)

District: Rotorua

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

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**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Rotoma Forest Corridor

ID number: 73 (56)

District: Rotorua/Whakatane

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Te Pareoterawahirua Ridgeline and Western Slope

ID number: 74 (28)

District: Western Bay of Plenty

General change since 1997: Expansion of quarry to the south east of area.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform	Ongoing quarry activity to the south east.	
Change in Waterform		
Change in Vegetation Cover	Expansion of quarry to the south east of area and limited plantation forestry.	
Change in Structures		
Change in Infrastructure		

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name Matata Scenic Reserve

ID number: 75 (60)

District:

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Mt Edgecumbe (Putauaki)

ID number: 76 (63)

District: Whakatane

General change since 1997: Changes in vegetation cover in relation to commercial forestry operation and scrubland regeneration.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform		
Change in Waterform		
Change in Vegetation Cover	Commercial forestry rotations.	Possible scrubland regeneration.
Change in Structures		
Change in Infrastructure		

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Whirinaki Forest

ID number: 77 (66)

District: Whakatane

General change since 1997: No apparent change identified – 1998 aerial photography incomplete.

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Ikawhenua Forest and Urewera Forest

ID number: 78 (67)

District: Whakatane/Opotiki

General change since 1997: No apparent change identified – 1998 aerial photography incomplete.

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Pohutukawa Coastal Forest

ID number: 79 (71)

District: Whakatane

General change since 1997: No apparent change identified.

CATEGORY	DETRACTOR	ENHANCER
Change in Landform	Ongoing possible quarry operation near north western boundary.	
Change in Waterform		
Change in Vegetation Cover		
Change in Structures		
Change in Infrastructure		

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Native Bush Reserves

ID number: 80 (76)

District: Whakatane

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Otamaroa

ID number: 81 (67)

District: Whakatane

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.

BAY OF PLENTY REGION
LANDSCAPE INDICATORS REPORT

**Bay of Plenty Region – Outstanding Natural Features and Landscapes
Landscape Change since 1997 affecting Outstanding Natural Features and Landscapes**

ONF&L name: Rangitaiki Frost Flats

ID number: 82 (New)

District:

General change since 1997: No detractors or enhancers were identified for this site due to no visibly apparent changes since 1997.