

PERIODIC REPORTING ON THE APPLICATION OF THE WORLD HERITAGE CONVENTION

II.1 INTRODUCTION

(a) **State Party:** New Zealand

(b) **Property Name:** Tongariro National Park

(c) **Geographic Information:**

Located in the central North Island. The Park extends for a longitude of 175° 22' E to 175° 48' E and a latitude of 38° 58' S to 39° 25' S.

Maps attached on following pages

(d) **Inscription Date:**

The site was inscribed on the World Heritage list for its natural values in 1990 and or its cultural values in 1993.

(e) **Reporting Organisation**

The reporting organisation is the Department of Conservation, www.doc.govt.nz

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(g) **Signature on Behalf of State Party**

Map of Tongariro

Co-ordinates of boundary points

II.2 STATEMENT OF SIGNIFICANCE

Tongariro National Park was inscribed on the World Heritage list in 1990 under natural criteria ii and iii for its outstanding natural values.

Tongariro National Park was inscribed on the World Heritage list in 1993 under cultural criterion VI for its outstanding cultural values.

Tongariro National Park is an extensive natural area. The Park contains active and extinct volcanoes, a diverse range of ecosystems and highly scenic landscapes. The area was the genesis of New Zealand's national park system, inspired by the unique gift in 1887 by Te Heuheu Tukino and his people, of the sacred mountain tops to the people of New Zealand.

The mountains at the heart of the Park have cultural and religious significance for the Maori people and symbolise the spiritual links between this community and its environment.

(a) World Heritage Committee Observation At The Time Of Inscription

(i) 1990

The Committee inscribed Tongariro for its natural values (ii) and (iii) and noted that the new Management Plan for Tongariro National Park adequately dealt with concerns expressed at the time of nomination. The nomination had been deferred until the revised Management Plan had been completed and dealt with the following issues:

- “The extent of ski development on Mt Ruapehu, the current plans for expansion and the impact of these developments on cultural values and ‘image’ of the Park. This is compounded by new prospects for slope grooming and snowmaking, which would have substantial impacts on scenic values and hydrology. It has been suggested that the skifields of Tongariro would be very susceptible to effects of global warming which would require on upward movement of skiing activity; and
- The extent to which the cultural values of the Park are given prominence in the new Management Plan and the level of involvement by the local Maori people”

The completed plan dealt with these issues and clearly restricted skifield development to identified amenity area boundaries and limited development outside the amenity areas. It was emphasised that there would be no recreational use of helicopters or over-snow vehicles in the Park, nor would there be further ski club lodges or commercial accommodation.

The World Heritage Committee congratulated the authorities for recognising the need to limit inappropriate recreational development and their efforts to strengthen the appreciation of the cultural values of Tongariro in the new Management Plan.

Cultural status was declined because Tongariro National Park did not fit their criteria.

(ii) 1993

In 1993 UNESCO reviewed cultural criteria to include 'associative cultural landscape' and cultural status (iv) was inscribed in the same year. It was noted that the mountains at the heart of the park have cultural and religious significance for the Maori people and symbolise the spiritual links between this community and its environment.

(b) Action Taken To Further These Observations

All requests for commercial development have been assessed against the existing Management Plan and tested to ensure that natural and cultural values have not been adversely affected.

The new Tongariro/Taupo Conservation Management Strategy (CMS) has reinforced the policies of the Tongariro National Park Management Plan to limit the impacts of tourism developments and take greater account of the cultural values (See II.3 and II.4.1).

The Tongariro National Park Management Plan is currently being reviewed and the draft plan provides a set of guiding principles that reflect dual World Heritage status.

(c) World Heritage Values of Tongariro

Tongariro National Park is an area of 7959 hectares situated in the Tongariro and Wanganui regions in the middle of the North Island, on the central North Island Volcanic Plateau. The boundary encircles the Ruapehu, Ngauruhoe and Tongariro mountain mass at an altitude of 500 – 1550 metres. An extension, 3km north of the main peak area and separated from it by Lake Rotoaira, includes Lake Rotopounamu, Mount Pihanga and Mount Kakaramea.

Physical Features

Tongariro National Park is the south-western terminus of the Pacific 'Ring of Fire'; the Park's volcanic activity being the result of tectonic plate movement. Subduction of the Oceanic Pacific Plate under the Indo Australian plate has given rise to a major chain of active volcanism in the North Island. This chain stretches from Mount Taranaki in the west to White Island in the east. In the north it extends beyond New Zealand to Tonga.

Tongariro National Park is the only extensive part of this chain that is still in its natural state, and protected. Moreover, this area is the most spectacular example of andesitic mountain building in the south-west Pacific.

The volcanoes of the park are highly active. Mount Ruapehu has a continually steaming Crater Lake and in the last 150 years there have been 40 steam and ash eruptions and lahars. The most recent eruptions in 1995 and 1996 were spectacular and attracted worldwide attention.

The volcanoes have a history reaching back one million years. Their modern form reflects the dynamic balance between cone building by episodic volcanism and destruction by erosion. During the last ice age Mount Ruapehu and Mount Tongariro generated glaciers, which flowed to below 1200 metres. Their erosive power altered the shape of the existing volcanoes by excavating deep valleys and moving layers of volcanic ash. The resulting debris can be seen as moraine ridges for example around the Mangatepopo Valley. A feature of the interaction of volcanic activity with glaciers was

the frequent generation of lahars and the rapid flow of mud and rock debris. These lahars built extensive lahar plains in the southern regions.

Since the ice age, volcanic activity has created new and modified old landforms. Due to volcanic activity about 2,500 years ago, a new vent began to form on the old eroded slopes of Mount Tongariro. Over centuries, frequent eruptions of pyroclastic material and molten lava slowly added volume to the growing cone now known as Mount Ngauruhoe. This volcano is still in the 'cone building' stage, with regular eruptions maintaining its near perfect conical form. The most common eruptions are pyroclastic of which 60 have occurred in the last 150 years. Many of these eruptions were small but there have been several phases of violent activity including high explosive ash eruptions. Lava has flowed during three separate eruptive phases, the most recent in 1954 was an eruptive sequence that started with a series of ash eruptions and developed into the largest lava flow observed in New Zealand, with an estimated volume of eight million cubic metres.

Mount Tongariro rises to an altitude of 1968 metres. It is a complex, multiple volcano formed from numerous overlapping and coalescing vents. Some areas have been heavily glaciated forming deeply dissected centres but are now partially buried by younger substantially intact volcanic cones and modified by explosions. The South Crater, although called a crater is actually thought to have formed from ice erosion.

A geothermal field, Ketetahi, exists under the northern and central areas of Mount Tongariro. This field has surface fumarolic features and 'springs' that surface at Ketetahi. The immediate area of the springs, which are believed to have healing powers, have been retained in Maori ownership. However, the Maori owners allow restricted access. Some vents at the springs produce steam up to 138°C, while other release hot gas charged water. The hydrothermal deposits and acidic, sulphate-rich water from the springs are covered with red and blue-green heat tolerant algae. Two other smaller geothermal surface manifestations are present on Mount Tongariro. They are Red Crater and Te Maari Crater.

Mount Ngauruhoe is separated from Mount Ruapehu by the Tama Saddle. It is the site of seven explosion craters formed about 10,000 year ago. Some, known as the Tama lakes, are partly full with water. These are the largest explosion craters in the Park.

Mount Ruapehu is a multiple andesitic volcano, considerably younger than Mount Tongariro. It has an extensive summit area 3km from north to south and up to 1.5km wide. First eruptions are estimated to have occurred 500,000 years ago and activity has been intermittent since. Over time large lava flows have occurred building up the volcano to its present imposing height. The current active vent is filled by the 15 hectare Crater Lake which, over the last 120 years, has been the site of over 40 steam and ash eruptions. At an altitude of 2550 metres, the Crater Lake presents a contrast of volcanic heat with glacial ice. It is the only hot lake surrounded by glaciers in New Zealand and one of a few in the world. The average temperature of the lake fluctuates between 20-40°C but has reached an extreme of 60°C. The water is heated by volcanic gases that rise through the vent into the lake. Minor steam eruptions occur from time to time, while major phreatomagmatic eruptions initiated from beneath the lake also occur. Molten lava from the vent mixes with lake sediment and water and may surge out of the lake over the snow and ice, causing rapid melting and forming a lahar. Major lahars have occurred in 1969, 1974, and 1995.

One of the largest eruptions to occur anywhere in the world in the last 5,000 years was the Taupo eruption in AD 186. It has been estimated that pumice was ejected to form an eruption column reaching a height of 50km from a vent now beneath Lake Taupo.

The central North Island was showered with rhyolitic airfall to depths of 5m. Towards the end of the eruption, the tall column became unstable and formed a giant fountain, which generated a large hot pyroclastic flow. The flow is believed to have travelled 600km per hour horizontally and flowed over Mount Tongariro.

Ash-filled valleys and depressions cooled to form an ignimbrite layer up to 100 metres thick. The flow levelled and buried or incinerated vegetation in Tongariro National Park leaving only the south west slope of Mount Ruapehu and the western area of Hauhangatahi undamaged.

The Rangataua lava flow on the southern shoulder of Mount Ruapehu is 14km long and 150 metres thick in places, forming the largest intact andesitic lava flow in New Zealand and one of the largest in the world. This flow originated from an active vent of the south west slope of Mount Ruapehu. The flow is now only partly within the park but legal arrangements are being made to protect a larger area of the flow by extending the park boundaries.

Hauhangatahi is a satellite of Mount Ruapehu situated 12km to the north west. It has a distinctive shape. Its upper slopes are a broad very low angle volcanic cone, mounted on a steep sided base of Tertiary marine mudstone. Hauhangatahi is at the edge of the southern limit of destruction from the Taupo eruption and vegetation on the western side remains generally undisturbed.

Around the southern volcanoes are gently sloping expanses formed from lahar debris. At an altitude of 500 m these plains extend 10-20km from the base of the volcanoes. Much of this area lies outside the park and has been modified by man but the area within the park is preserved in its natural state.

The northern area of the park is dominated by Mount Pihanga (1321m), a cone shaped andesitic volcano with a large scar on its side from a landslide. The volcano is dormant and its associated plain is small due to faulting in the area. Lake Rotopounamu, the largest lake in the park occupies part of the Rotopounamu graben, which lies between Mount Tihia and the western slopes of Mount Pihanga.

Flora and Fauna

The altitudinal sequence of vegetation in the nominated area begins with lowland podocarp/hardwood rainforest and passes through a wide zone of montane beech forests, shrublands and alpine gravelfields. This sequence has been greatly modified by volcanic events, including the catastrophic Taupo eruption of AD 186, by fires, the activities of Maori and European settlers and the introduction of exotic fauna and flora.

Threatened plants present and being actively protected include three species of mistletoe and dactylanthus.

New Zealand has been isolated from the rest of the world for about 80 million years and has a very limited vertebrate fauna, dominated by birds. The only extant native terrestrial mammals in New Zealand are two species of bats, both of which are found within the park. The long-tailed bat and the short-tailed bat found in the forest areas are designated threatened (IUCN vulnerable category).

New Zealand's bird fauna has been substantially reduced in the thousand years of human occupation, and many more species are at risk. Reasons for their decline include habitat loss, competition with introduced species, predation and other unknown causes.

Several threatened bird species are found within the park. In the forest areas, these include the North Island kiwi and the kaka, which are regarded as vulnerable according

to IUCN categories (See II.4.4). Also in forest areas is the North Island robin which is threatened on a regional scale and the long tailed cuckoo, which is a rare breeding species in New Zealand.

The lakes, rivers and swamps in the park provide habitats for the threatened (IUCN category) blue duck and North Island fernbird. The threatened banded dotterel is found in open areas and the threatened New Zealand falcon is ubiquitous but in low numbers.

Culture and History

The mountains of Tongariro National Park are special for their intense intangible cultural associations with the indigenous people. The best expressions of these are in the vitality of the tribal oral histories of Ngati Tuwharetoa and Ngati Rangi, in their songs, carvings and in their stories.

“We look upon them with deep respect and reverence and a tinge of many other complimentary emotions, pride certainly being one of them. Proud that they are ours (Te ha o taku maunga ki taku manawa – the breath of my mountain is my heart), and proud that they are bequeathed to the nation who as nature lovers accord them their deep respect. Our reverence for the mountains goes deeper than that in time, with the essence of our genealogies, all life forms originated from the same parents Papatuanuku, the Earth Mother and Ranginui, the Sky Father so that man and all other life forms are in harmony with one another in the bonds of kinship.”

Tuwharetoa spokesperson, (Tongariro National Park Management Plan, Vol. I)

The gift of Tongariro as a “*sacred place of the Crown*” was unique. Unlike any of the three preceding parks in the United States, Canada and Australia this was a gift from an indigenous people. Protection of this area established a threefold bond amongst the land, Maori and pakeha (predominantly British settlers). It was an act driven by the need to protect and also to safeguard its spiritual and cultural associations. The spirit of this gift continued in the creation of further national parks around the country.

The gift is also significant as the catalyst of the national park system in New Zealand. Tongariro, New Zealand’s first national Park, is now the area most visited by international tourists. The symbol used during the centenary celebrations of the national park system and for promoting national parks is based on Mount Tongariro, and stresses its importance as the beginning of the country’s park network.

The following is a brief summary of how the cultural values of the Park are completely interwoven:

- The power of the unbroken association of Ngati Tuwharetoa with the mountains since the landing of the Arawa canoe; the strong association is both a physical (Pacific ‘ring of fire’) and a cultural connection through the tribe’s ancestor, Ngatoroirangi (the high priest and navigator of the Arawa canoe who brought his people from their Pacific origins in the Hawaikis). The cultural links are clearly demonstrated in the oral history, which is still a pervasive force for Ngati Tuwharetoa. The peaks are spoken of with the same reverence and feeling as tribal ancestors, ensuring that the connection is one of spirituality as well as culture.

- The linkage of cultural identity with the mountains; Tongariro, Ngati Tuwharetoa and Te Heuheu are inextricably linked in the tribal pepeha (proverb) recited at any occasion hosted by the Ngati Tuwharetoa iwi (tribe).

Ko Tongariro te Maunga
 Ko Taupo te Moana
 Ko Ngati Tuwharetoa te iwi
 Ko Te Heuheu te tangata

Tongariro is the Mountain
 Taupo is the sea (inland lake)
 Ngati Tuwharetoa is the tribe
 Te Heuheu is the Chief

- The cultural significant of the gift; Horonuku's gift in 1887 formed the nucleus of the first national park in New Zealand, and only the fourth in the world. Significantly this was the first such gift from an indigenous people. The spirit of this gift fostered the formation of the national park network in New Zealand, and thus has safeguarded some of the most outstanding landscapes in the world from development.
- The high recognition, throughout New Zealand, of the rich cultural tapestry woven between Ngati Tuwharetoa and the Park; this was clearly demonstrated in the 1987 centennial celebrations held throughout the country, World Heritage celebrations in 1998, the opening of the Whakapapa Visitors Centre and the prominence given to cultural values in the centre and in its audio visual presentations. The Visitor's Centre provided a mechanism for reflection on the importance of the gift and of continuing to preserve and protect the mountains.

(d) World Heritage Area Boundaries

The boundaries of Tongariro National Park have not been altered since the site was inscribed for its natural values in 1990. A proposal to include the Rangataua Conservation Area, 6100 Ha, is awaiting resolution of a Treaty of Waitangi Claim. This would add an area of key ecological value but it is not essential as a buffer zone for the protection of the Park. At present the Rangataua Conservation Area is being managed in partnership between the Department and Ngati Rangi, who is the tribal authority in that area. The management is aimed at both ecological and cultural restoration.

To the east of Tongariro National Park is the Kaimanawa Conservation Park, an area of 77 348 Ha. To the north west is the Erua Conservation Area, which has been protected for conservation purposes by the Department of Conservation since 1987. These two areas help provide a buffer to ensure the protection and conservation of the property's values.

II.3 STATEMENT OF AUTHENTICITY/INTEGRITY

World Heritage values of Tongariro National Park identified in the nominations for both natural and cultural values and at the time of inscription have been maintained and in several key instances these values have been enhanced.

Natural Values Inscription

The Management Plan limits tourism development in the World Heritage Area by ensuring no extension to Amenity Areas, including the commercial skifields. The World Heritage Committee had expressed concerns about these areas at the time of nomination but noted management improvements at the time of inscription in 1990. Since 1990, the Conservation Management Strategy has reinforced the policies of the Management Plan to limit infrastructural development in the World Heritage Area.

There is no additional public recreational infrastructure outside the skifield amenity areas.

Public awareness and understanding of the property has been enhanced by a redevelopment of the Whakapapa Visitor Centre and new displays at the Ohakune Visitor Centre. A new Park handbook has been produced and other publications updated. New signage has been installed throughout the World Heritage Area. A new website is partially constructed.

Education resource kits have been prepared to assist teachers with schools visiting the World Heritage Area. A web-based World Heritage education programme known as LEARNZ was initiated for the World Heritage Area. Its themes were both natural and cultural.

Visitor pressures have been addressed in the current National Park Management Plan and the Conservation Management Strategy. The National Park Management Plan is currently being reviewed with full public consultation. Addressing visitor use and management problems associated with the Tongariro Crossing is a key issue.

Sewage issues have been addressed with approval to construct a reticulated ground disposal sewage scheme to deal with effluent from the Whakapapa Skifield and the Whakapapa Village. Other toilets in the Park are being converted to dry vault systems.

Following volcanic eruptions in 1996 and 1997 ash debris build up at the Crater Lake outlet has meant that the Crater Lake will refill in the period 2002 – 2004 to a higher level than before. This creates the potential for a lahar of greater magnitude than previously recorded in European times (See II.5.2). An 'Environmental and Risk Assessment for mitigation of this hazard was prepared in 1999.

The Minister of Conservation has addressed mitigation proposals and resolved not to intervene at the Crater Lake but to install an early warning system to protect road and rail travellers from any hazard and to install an embankment to prevent overflow into the Waikato River and on to State Highway 1.

Cultural Value Inscription

At the time of the 1990 inscription of natural values, the World Heritage Committee noted that the new Management Plan had taken greater account of the cultural values of Tongariro.

Cultural inscription of Tongariro did not occur until 1993 when the Committee added an 'associative cultural landscape' category. Since that time, there has been increased Maori participation in the management of the World Heritage Area.

The Conservation Management Strategy for Tongariro Taupo Conservancy identified how the principles of the Treaty of Waitangi will be implemented in the management of Tongariro National Park and other conservation areas. Maori are now consulted on all significant management actions in Tongariro National Park, especially where cultural values are involved. Active involvement has included planning World Heritage

celebrations, upgrading visitor centre displays and audio visuals, education resources, biodiversity programmes and assessing concession applications. Cultural perspectives were a key issue in the analysis of the Crater Lake issue.

There are now four Maori members of the Conservation Board. Staff awareness of Maori issues and cultural values has increased markedly since cultural inscription in 1993 and staff have recently attended a cultural training programme.

II.4 MANAGEMENT

Tongariro National Park is managed by the Department of Conservation under legislation contained in the Conservation Act 1987 and the National Parks Act 1980. The Conservation Act established the Department of Conservation, the New Zealand Conservation Authority and the Conservation Boards, and set out processes for managing conservation areas. The National Parks Act establishes principles for national parks. Conservation Boards prepare Conservation Management Strategies and Conservation Management Plans including the Tongariro National Park Management Plan. All are approved by the New Zealand Conservation Authority.

The Tongariro Taupo Conservation Board is required to monitor the implementation of the Tongariro Taupo Conservation Management Strategy. The legislation provides a very high level of protection and management integration.

Operational management of the property is the responsibility of the Tongariro Taupo Conservator under the oversight of the Regional General Manager (Northern).

Conservancy representatives ensure that particular World Heritage Area outcomes are included in the Department's strategic directions and business planning process. Delivery of these outcomes occurs at two Area Offices and a Field Base, where conservation management projects and programmes are undertaken by Rangers.

The Tongariro Taupo Conservation Management Strategy sets out higher level conservation management goals and objectives, and the Tongariro National Park Management Plan provides more specific direction to managers. Further direction is provided by the General Policy for National Parks and by the department's internal planning, operating and performance reporting framework.

Community participation in the management of the World Heritage Area is achieved via a conservancy wide Conservation Board and the New Zealand Conservation Authority. Section 4 of the Conservation Act spells out the Department's requirement. This requirement is further described in the Conservation Management Strategy and the Tongariro National Park Management Plan.

Key management actions that have been taken to enhance the World Heritage values of the property can be described under the following categories: statutory planning; species recovery; pest management; education; stakeholder participation; research knowledge and performance evaluation.

II.4.1 Statutory Planning

Mention has been previously made (II.2b and II.3) of two key statutory planning initiatives that relate to the property. These initiatives are further elaborated here.

Conservation Management Strategies

The Tongariro Taupo Conservation Management Strategy outlines the strategic priorities and key sites for biodiversity conservation and visitor access for a ten year period.

The current Tongariro Taupo Conservation Management Strategy was approved in May 2002. It involved extensive public consultation and, in particular, discussion with Maori to reach agreement on how the principles of the Treaty of Waitangi would be applied to the management of the Tongariro Taupo Conservancy.

The current Tongariro National Park Management Plan was approved in 1989 and is currently being reviewed through a full public process. The draft plan, released in August 2002 sets out the World Heritage natural and cultural values of the National Park and provides a set of principles to guide specific policies.

II.4.2 Protection of Natural and Cultural Values

The current Tongariro National Park Management Plan provides a very clear guide as to how the Park should be managed. In particular it has been very helpful in protecting the natural and cultural values of the mountain peaks of Ruapehu, Ngauruhoe and Tongariro and in limiting commercial developments to the three amenity areas. Within amenity areas, the plan is quite specific as to acceptable levels and type of development. The Management Plan is also clear about the need for maintaining existing facilities such as tracks, huts and roads and establishing that additional facilities would be inappropriate.

The Plan has been helpful in resolving key issues such as the proposed intervention at the Crater Lake of Mount Ruapehu (See II.5.2), setting appropriate conditions for major filming activities, limiting aircraft usage and in promoting the need for improved biodiversity management and removal or ground treatment of sewage effluent.

It is not proposed to have significantly different policies in the new Management Plan but intended they will be supported by a much improved description of natural and cultural World Heritage values, and a set of guiding principles including recognition of Maori involvement in management.

II.4.3 Tourism and Recreation

The Conservation Management Strategy and Tongariro National Park Management Plan have provided a clear framework to ensure that any significant tourism infrastructure is sited within gazetted amenity areas. At the same time the policies are clear as to the type of development and use that can take place within the amenity areas. For example, the Management Plan restricts any further commercial accommodation from being sited in the amenity areas. It also required sewage in Whakapapa and Iwikau Villages to be reticulated to a treatment plant and effluent to be ground treated.

Recreation and tourism is limited by a requirement for any infrastructure to be sited outside the World Heritage Area with the exception of existing tracks and huts and other facilities required for essential park management

Two small wilderness areas ensure that some parts of the World Heritage Area are free from any facilities.

Most recreation and tourist pressure outside the amenity areas is associated with walking on Mount Tongariro. Walking tracks are showing signs of environmental impact and their hardening and restoration is a significant management priority, together with ensuring there are no adverse effects from human waste. Additional toilets are being provided and all toilets are being converted to dry vaults.

The Department of Conservation accepts that measures will be required to limit visitor numbers on Mount Tongariro to levels that are environmentally, culturally and socially acceptable. These issues are being addressed in the review of the Tongariro National Park Management Plan.

Other significant pressures that are being addressed include limiting the impact of aircraft and of commercial filming. The current Management Plan has been successful in limiting aircraft use to essential park management and there are sound constraints to minimise impacts of commercial filming. The impacts of overlying aircraft cannot be controlled by the Management Plan. This requires discussion with other agencies and aircraft operators.

II.4.4 Species Recovery

Priority has been given to species that conform to the IUCN's categories of rare or endangered. Active survey and protection programmes exist for three species of mistletoe (*Peraxilla tetrapetala*, *Tupeia antarctica* and *Alepis flavida*) and dactylanthus (*Dactylanthus taylorii*). Significant improvements have happened with active management of targeted animal pest control and tree protection.

Kiwi (*Apteryx mantelli*), blue duck (*Hymenolaimus malacorhynchos*), kaka (*Nestor meridionalis septentrionalis*) and the short tailed bat (*Mystacine tuberculato*) are all actively monitored and part of research programmes.

II.5 FACTORS AFFECTING THE PROPERTY

II.5.1 Tourism and Recreation

Tourism demands continue to put pressure on the need for additional ski field facilities and accommodation and other facilities and services at the two commercial ski fields and Whakapapa Village. A Conservation Management Strategy and Tongariro National Park Management Plan with strong philosophies, principles and clear policies help ensure any new approvals are in keeping with the natural, social and cultural values of the Park.

The installation of a reticulated ground disposal sewage scheme for Whakapapa Skifield and Whakapapa Village in 2003/04 will be a significant improvement.

Increased visitor impacts on Mount Tongariro give rise to key environmental, social and cultural issues. There is some tension between appropriate visitation to this spectacular volcanic area and protecting cultural values. Key issues being addressed through a Management Plan review are treatment of sewage, need to restrict the impact of visitors, need to consider limiting visitor numbers, and whether to permit commercial guiding in view of iwi (Maori tribal) concerns at commercialisation.

Throughout the World Heritage Area the use of dry vault toilets is being promoted to ensure there is not toilet waste remaining on site. As resources are available, hard surfacing of tracks and restoration of disturbed areas are a management priority. The

Department has recently received increased funding to replace existing visitor facilities and to maintain them to standard.

Demands for commercial filming are increasing rapidly. These requests can have an impact on natural, social and cultural values. The Tongariro National Park Management Plan review will address these issues and impose appropriate limitations.

Aircraft are not currently permitted to land in Tongariro National Park for reasons other than 'essential Park management'. This is likely to continue but impacts from tourist over-flying are continuing to increase. These impacts cannot be controlled by Conservation legislation but advocacy efforts will continue to strive to encourage lower impact tourist flying.

II.5.2 Natural Disasters

In 1995 and 1996 a series of volcanic eruptions emptied Mount Ruapehu's Crater Lake and built an accumulation of ash deposits at the lake's outlet. This means that a significant lahar is inevitable once the lake refills. These events are part of the dynamic evolution of Tongariro National Park and the mountain peaks area significant taonga (treasure) for Maori. An environmental impact assessment was prepared, looking at a variety of ways in which the risk could be mitigated.

The Crater Lake of Mount Ruapehu, as part of the nucleus of the gift of Tongariro, is very much at the heart of the mountains that provide the natural and cultural values recognised in World Heritage status.

After extensive consultation with iwi and the community, the Minister of Conservation resolved not to intervene at the Crater Lake. The Minister chose to construct an early warning system to protect the public using roading and railway networks and also required the construction of an embankment near the Park boundary to prevent an overspill of the lahar into State Highway One and the Waikato catchment.

In November 1998 the Bureau of the World Heritage Committee commended the New Zealand authorities for the ethically and culturally sensitive manner in which the Crater Lake issue was being addressed. In December 2001 they discussed progress and decided to transmit a report to the World Heritage Committee. That report confirmed the Minister of Conservation's decision not to intervene at the Crater Lake.

In April 2002 the Bureau of the World Heritage Committee welcomed decisions made by the Minister and hoped that all parties would accept them.

The early warning system has been installed and is operative, the embankment has been constructed and emergency management planning is well advanced.

II.5.3 Animal and Weed Pests

New Zealand's flora and fauna developed in isolation for 80 million years and so are vulnerable to introduced animals and plants.

Many invasive alien species are present in the World Heritage Area. None has been eradicated since the time of inscription but increased efforts have been directed at sustained control of three key animal pests, the Australian brushtail possum (*Trichosaurus vulpecula*), red deer (*Cervus elaphus*), and sika deer (*Cervus nippon*).

Deer are kept at acceptable levels by commercial and recreational hunting. Exclosure plots and vegetation plots help monitor deer and possum impacts at a number of sites within the World Heritage Area. Results of this monitoring help assist management actions and priorities.

Possums are present throughout most of Tongariro National Park. Control is generally by means of poisoning. A variety of pesticides registered for use in New Zealand under the pesticides Act 1979 are used. Of these 1080 (Sodium monofluoroacetate) in cereal bait or gel form is the most commonly used because it can be closely targeted at possums and breaks down rapidly in the environment into non-toxic substances. It's the most cost effective method available for the consistent reduction and sustained control of possum populations in rugged terrain. Other toxins are available but they are less effective than 1080 or pose residue problems for the environment.

In Tongariro National Park approximately 15,700 Ha is subject to sustained control of possums. The total vulnerable habitat in the Park is 30,000 Ha. This work is targeted to protect priority places where biodiversity values are assessed to be most at risk. Rats (*Rattus rattus*) and in particular stoats (*Mustela erminea*) pose most threat to wildlife values in the World Heritage Area. At present there is no successful method to eradicate or control significantly these pests and so this is a priority national research project currently being undertaken by the department.

There has been sustained management to reduce the impact of introduced weeds; lodgepole pine (*Pinus contorta*) and broom (*Cytisus scoparius*) in particular and biological control of heather (*Calluna vulgaris*) is gaining momentum.

II.6 MONITORING

Extensive monitoring occurs within Tongariro National Park. This can be described in the New Zealand context as being either result or outcome monitoring of particular biodiversity management programmes or as qualitative monitoring of particular activities or sites.

Monitoring of cultural values has not been attempted specifically for the World Heritage Area but Te Puni Kokiri (the Ministry of Maori Development) has responsibility for monitoring the performance of all government departments in their relationship and responsibilities to Maori. They carry out regular surveys and reviews of the Departments performance. The Conservation Management Strategy requires the Tongariro Taupo Conservation Board to monitor the performance of all management in Tongariro National Park. This will include monitoring management actions relating to cultural values.

Biodiversity monitoring normally occurs in conjunction with specific management programmes to determine whether they have been successful. An example of result monitoring would be measuring the post and pre population of possums (*Trichosaurus vulpecula*). Bird population monitoring will also be used to determine the success of possum control. This and the measurement of permanent vegetation plots are examples of outcome monitoring. Regular re-measuring of these plots or populations will show trends in biodiversity change. Results indicate that the current level of pest control is halting floral biodiversity loss but fauna is suffering from the presence of rats (*Rattus rattus*) and stoats (*Mustela erminea*). Monitoring is also put in place to measure any changes following fires.

Visitor Monitoring occurs at high use visitor sites to determine the extent of visitor satisfaction or dissatisfaction with facilities or commercial tourist activities such as the Tongariro Crossing. Concession activities are also monitored for environmental impact. Volcanic hazard monitoring is carried out on an ongoing basis.

The Department of Conservation has identified the need for information from which to measure trends in New Zealand's biodiversity. 'Condition' monitoring is required to

detect and measure changes in biodiversity or other ecosystems attributes, to better understand functional linkages in ecosystems and to evaluate the success or failure of conservation policies. Current monitoring methods are not consistent in design.

The Department is in the early development phase of design, testing and costing a monitoring system that will meet the Departments reporting requirements enabling identification and quantification of human induced change in condition of indigenous biodiversity from natural variation.