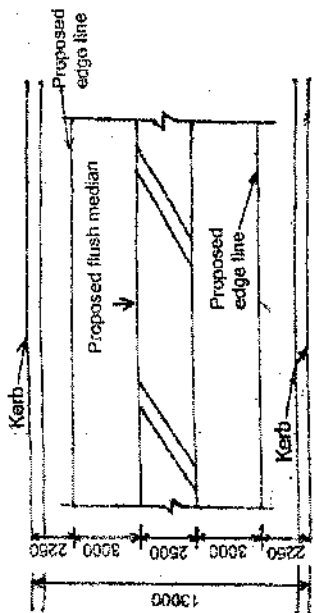


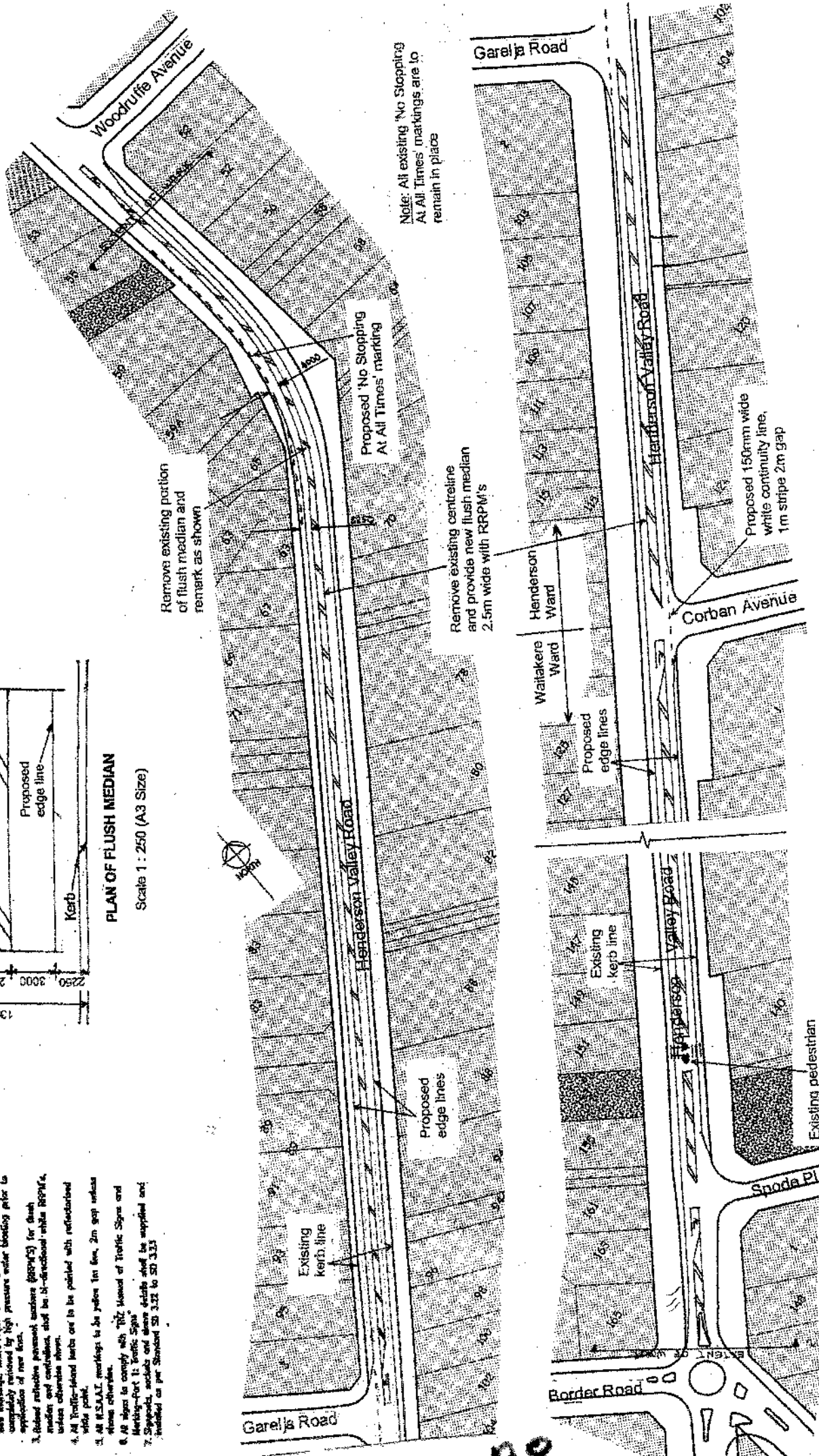
**ROADMARKING NOTES**

1. All road markings to comply with LISA (TAZ) Manual of Traffic Signs & Markings-Part 2: Markings.
2. All existing markings to be removed where they conflict with new markings. Where required, adding new markings shall be completed prior to the start of construction.
3. Road reflective pavement markers (RRPM's) for flush median and centreline shall be 30-directional white RRPM's, unless otherwise shown.
4. All Traffic-Island kerbs are to be painted with reflective white paint.
5. All RRPM's markings to be yellow 1m line, 2m gap unless otherwise shown.
6. All signs to comply with TAZ Manual of Traffic Signs and Markings-Part 1: Traffic Signs.
7. Stop, yield, advance and other details shall be supplied and installed as per Standard SD 3.2.2 to SD 3.3.3.



**PLAN OF FLUSH MEDIAN**

Scale 1 : 250 (A3 Size)



Note: All existing 'No Stopping At All Times' markings are to remain in place

**HENDERSON VALLEY ROAD  
PROPOSED FLUSH MEDIAN  
PLAN**

Scale 1 : 1250

A8

0103

**PIHA ROAD  
GORSE MANAGEMENT PLAN**

JULY 2004

on behalf of

**Waitakere City Council**

prepared by

**Kingett Mitchell Limited**

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## Executive Summary

Waitakere City Council (WCC) have undertaken to prepare a management plan for gorse at Piha, with the assistance of Kingett Mitchell Limited.

Gorse is abundant in southern parts of the Piha vicinity, particularly along roadsides and old fire tracts. The roadside populations are the responsibility of WCC, however, the other populations occur on privately owned land, or Auckland Regional Council (ARC) parkland, e.g., Lion Rock.

In the absence of fires or other landscape disturbances, the regeneration of native manuka / kanuka secondary forest is expected to widely suppress gorse throughout Piha within a 20 - 40 year timeframe. However, observations at some Piha sites suggest that gorse is particularly persistent in the dry coastal environment.

Until the main gorse populations are suppressed by native regeneration this weed presents a fire risk, particularly in mid-summer when it becomes tinder dry, and is a nuisance to Piha residents whose properties it occupies.

The primary focus of this management plan is on the roadside gorse populations. The objectives are to facilitate:

- A significant reduction of roadside populations of gorse within a 10 year timeframe.
- A reduction of the fire risk posed by gorse.
- Cost-effective roadside vegetation maintenance.

Facilitating the establishment of native shrub communities into gorse covered roadside sites is recommended, via either active revegetation or cutting back gorse to release naturally established native plants. The plants should be eco-sourced, and, where feasible, the planting zone wide enough to generate self-perpetuating ecosystems 10 - 20 m wide.

A mixture of fire resistant native shrubs is recommended for the most fire prone section of Piha Road, from the Piha Lookout to Seaview Road.

The short-term effects of the planted buffer communities are expected to be the reduction of fire risk and gorse seed dispersal capability. The mid-term effects are expected to be the acceleration of native vegetation regeneration, and suppression of gorse and other weeds along the roadsides.

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- Appendix B: Environmental Weeds on Piha Road, between the Karekare turnoff and Piha township.

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# 1. Introduction

## 1.1 Background

### Gorse Management under Noxious Plants Act (1978)

Gorse is a pervasive and aggressive weed of pastoral land. In recognition of its significant economic impact on agricultural productivity, gorse was classified as a Class B noxious weed under the Noxious Plants Act (1978), and was systematically sprayed or otherwise controlled (or control was enforced) by local councils throughout New Zealand. Accordingly, Waitakere City Council (WCC) implemented a regime of annual mowing and spraying of gorse at Piha, which suppressed the weed but had some undesirable outcomes including high costs, public concerns related to the ongoing use of herbicides, and erosion issues related to the repeated clearance of steep road cuttings (Fig. 1.1).

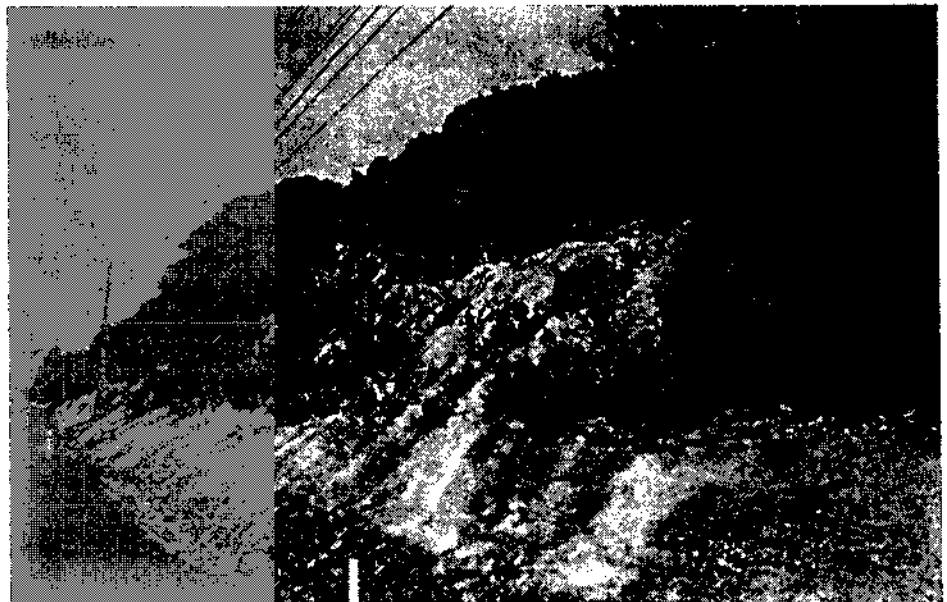


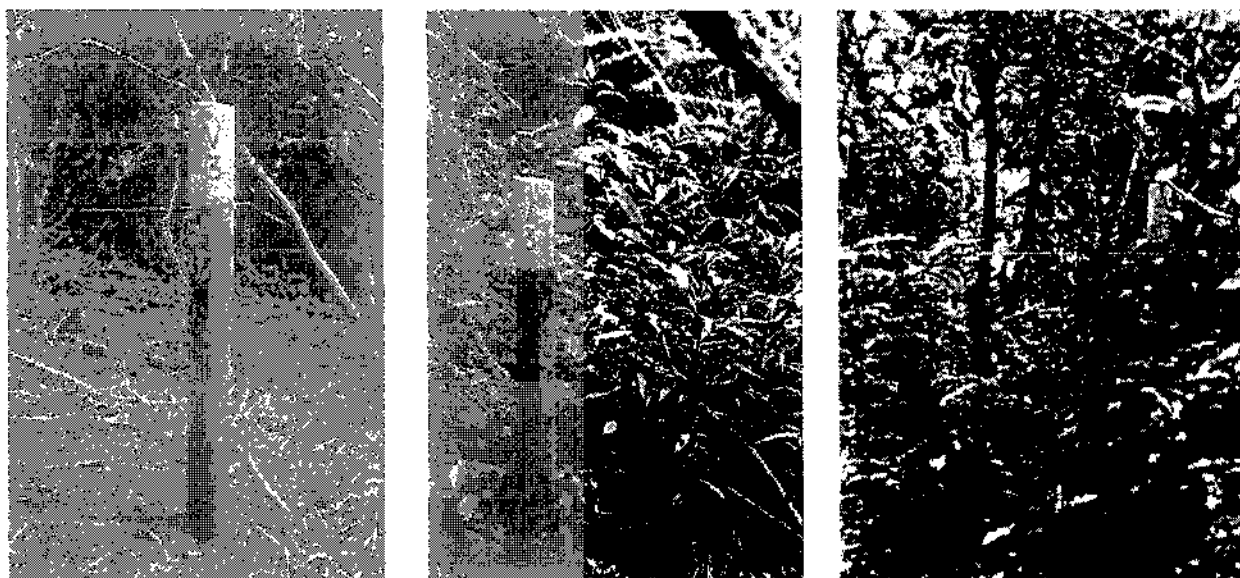
Fig. 1.1: Illustration of roadside vegetation maintenance under Noxious Plants Act.

### Gorse Management Under Biosecurity Act (1993)

The early to mid-1990s saw increased awareness of the need to apply a more strategic approach to weed management and biosecurity issues. The Noxious Plants Act was superseded by the Biosecurity Act (1993), which facilitated the development of regional management strategies for weeds in New Zealand. The threat of environmental weeds in natural areas was recognised as a significant management issue, of comparable potential in terms of resource allocation to agricultural weeds. A fundamental paradigm shift occurred with respect to gorse control. While intensive spraying of this weed continued in agricultural situations, the

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best approach adopted in natural areas became the exploitation of its role as an early successional 'nurse' plant and allowing native plants to regenerate through, and outshade it (e.g. at Hinewai (Wilson 1994) Fig. 1.2). The benefits to this approach of gorse control in natural areas are substantial, given that it bypasses the need for intensive herbicide use or manual labour. However, some aspects may yet need refining, especially in dry coastal environments where gorse is most competitive as a weed.



**Fig. 1.2: Hinewai gorse suppression trial showing sequence of native regeneration after 5 years (copied from Wilson 1994).**

WCC developed a weed management strategy for Waitakere City in 1999. In accordance with the Biosecurity Act their new strategic approach was to exploit the role of gorse as a 'nurse' plant, and shift their roadside and reserve weed control targets onto weed species considered to pose a greater ecological threat, such as Kahili ginger, moth plant, and *Tradescantia*.

### Ecological Outcomes

After approximately five years, gorse appears to be playing out its role as a nurse plant throughout most WCC administered roadsides and reserves in a predictable and ecologically beneficial way (Fig. 1.3). It is easily outgrown by secondary native vegetation on moderately moist flat or sloping terrain, and is often the first species to establish on vertical road cuttings, providing favourable microsites for native species. Gorse typically colonises the base of road cuttings where soil moisture collects. Regeneration seeded from the native plant communities on top of the cutting, and native/ gorse assemblages at the base of the cutting, gradually fills the driest central zone until the entire surface is covered.

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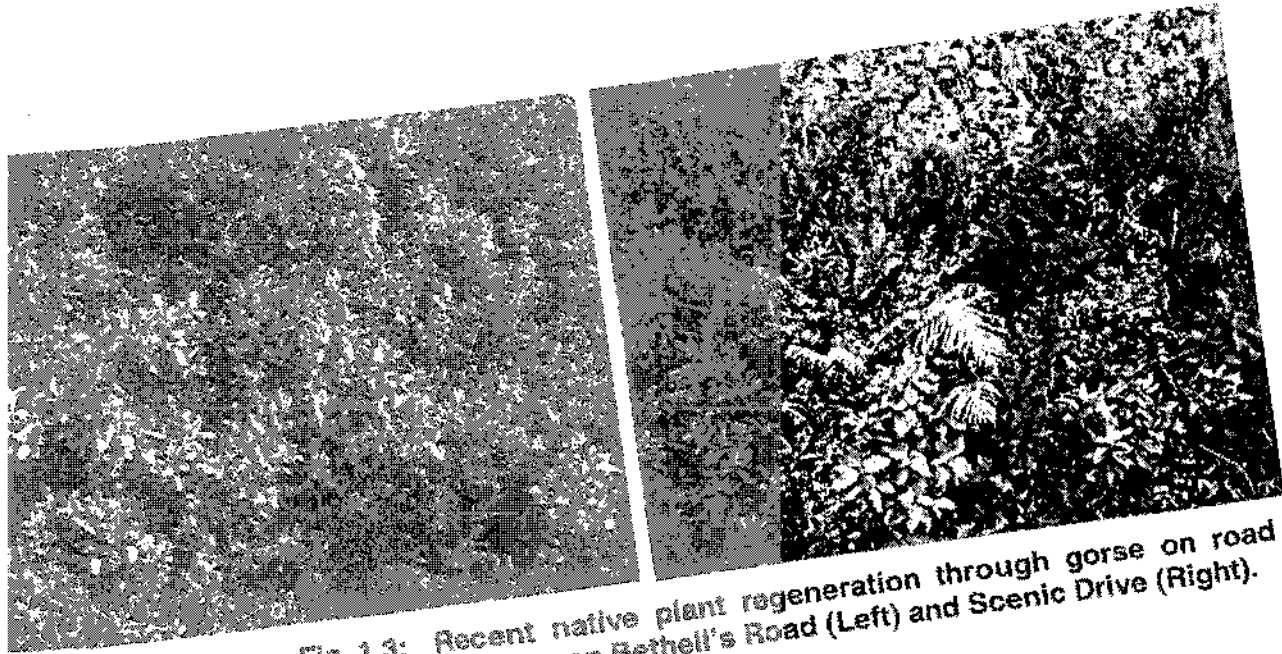


Fig. 1.3: Recent native plant regeneration through gorse on road cuttings on Bethell's Road (Left) and Scenic Drive (Right).

While abundant native regeneration can be observed at many of these sites, gorse is currently at maximum abundances in the Waitakere district because it is no longer actively controlled (except where required by the Auckland Regional Council (ARC) as a 'boundary control plant pest'), and the regeneration of native vegetation through gorse is generally incomplete (C. Firkens, *pers. comm.*).

#### Gorse in the Piha Environment

Piha falls within the coastal bioclimatic zone of the Waitakere Ecological District, which is distinctly drier than inland areas and subjected to strong westerly winds. Gorse flourishes in the arid environment, and is particularly advantaged by the relatively slow rate of native vegetation regeneration. Winds may be sufficiently strong to assist the dispersal of gorse's heavy seeds, particularly from exposed sites.

Moreover, the locality has a history of scrub fires, providing ideal new habitat for gorse to colonise. The plant itself becomes tinder-dry during the mid-summer months, exacerbating the fire risk. Retired farmland and old fire sites at Piha have regenerated back into manuka / kanuka forest (Fig. 1.4), illustrating the natural path of vegetation regeneration, and demonstrating that gorse could potentially be ultimately excluded via this process. However, any future fires will perpetuate the growth and spread of gorse.

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**Fig. 1.4: Secondary native vegetation cover at Piha.**

WCC is responsible for roadside vegetation maintenance at Piha, where gorse is currently abundant. Such sites have been specifically identified by residents and acknowledged by WCC as a high fire risk, and a significant contributing source of gorse propagules. The roadside gorse populations are therefore the primary focus of this management plan. However, gorse is also abundant elsewhere in the Piha vicinity beyond the jurisdiction of WCC, including Auckland Regional Council (ARC) parkland and private property. Hence, any management strategy for gorse needs to consider the wider context to ensure its long-term effectiveness.

## **1.2 Management Plan Objectives**

Waitakere City Council have undertaken to prepare a management plan for gorse at Piha. The objectives of this management plan are to facilitate:

- A significant reduction of roadside populations of gorse within a 10 year timeframe.
- A reduction of the fire risk posed by gorse.
- Cost-effective roadside vegetation maintenance.

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## 2. Description of Piha Gorse Populations

### 2.1 Overview

Gorse is common along the Piha Road margins from the Karekare Road turnoff to Piha township. Generally speaking, at the top of Piha Hill gorse often forms a dense fringe along areas of mixed native hardwood forest and manuka / kanuka shrubland. Typically young native shrubs are interspersed amongst the gorse in such sites. Gorse is the dominant vegetation cover on some vertical road embankments where native plants are less competitive, however, the weed only provides sparse cover on the prominent sandstone embankment at the top of Piha Hill. The uphill side of Piha Lookout, which was burnt in c. 1998, is densely vegetated in gorse, with some scattered young native plants present. Elsewhere down Piha Hill gorse is prominent amongst roadside vegetation, becoming less dense towards the bottom of the hill and on side roads.

For the purpose of this management plan sections (gorse management sites) of Piha Road and side roads have been distinguished by the nature of the site and local gorse population characteristics (Fig. 2.2). The following description of gorse populations at Piha is presented in accordance with these gorse management sites.

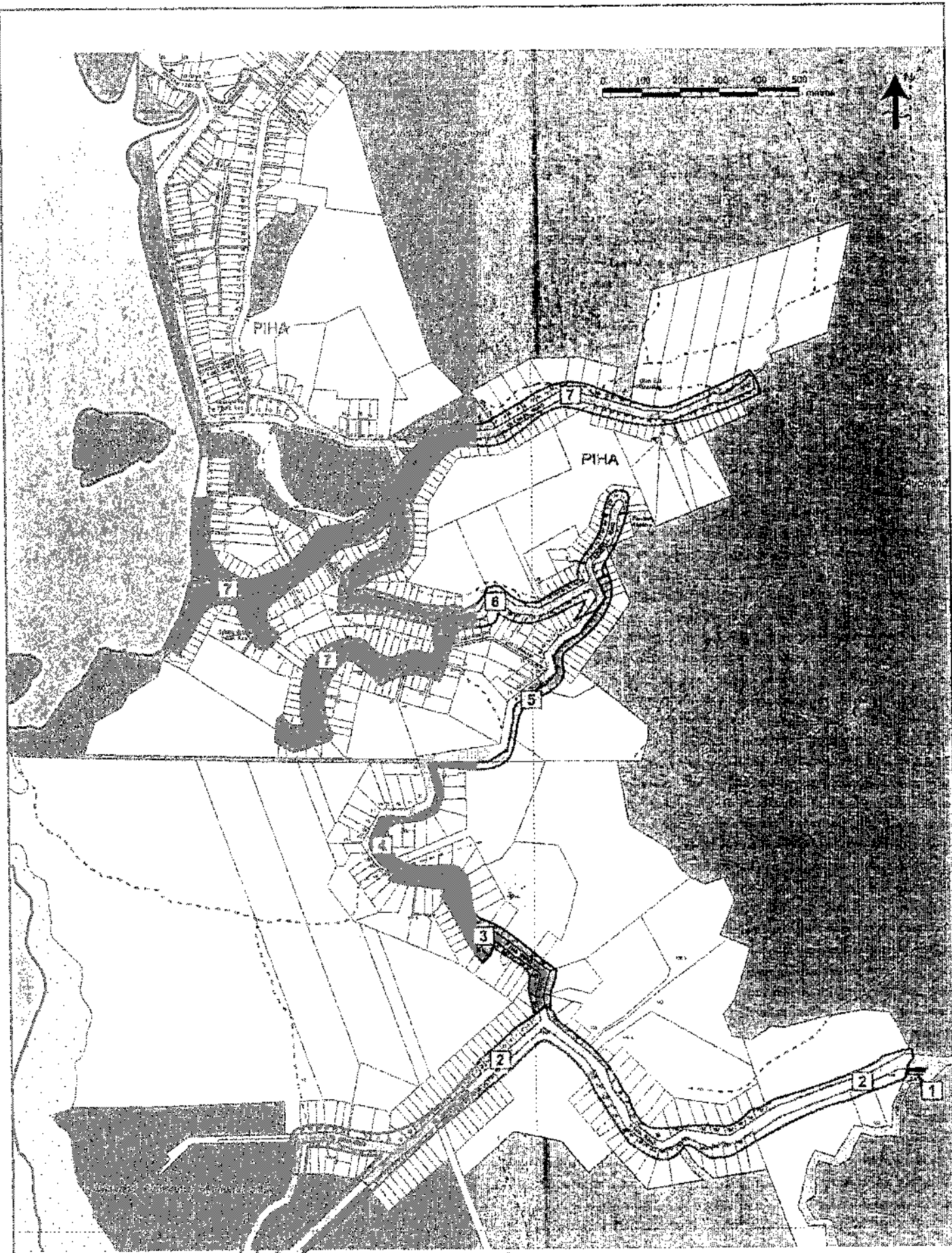
### 2.2 Site 1- Karekare Turnoff

Gorse is prominent on the north western embankment of the Karekare Road turnoff itself, where it forms a c. 65 % cover with interspersed manuka and other native shrubs (Fig. 2.1). The substrate is clay-based, moderately sloping, clay-based soil. The site has a north-eastern aspect and is therefore relatively sheltered from westerly winds.



Fig. 2.1: North Western Embankment of Karekare Road Turnoff.

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TITLE

SITE LOCATION MAP

DATE JUNE 2004

CLIENT

Waitakere City Council

PROJECT NO. 102018

FIGURE NO. 2.2