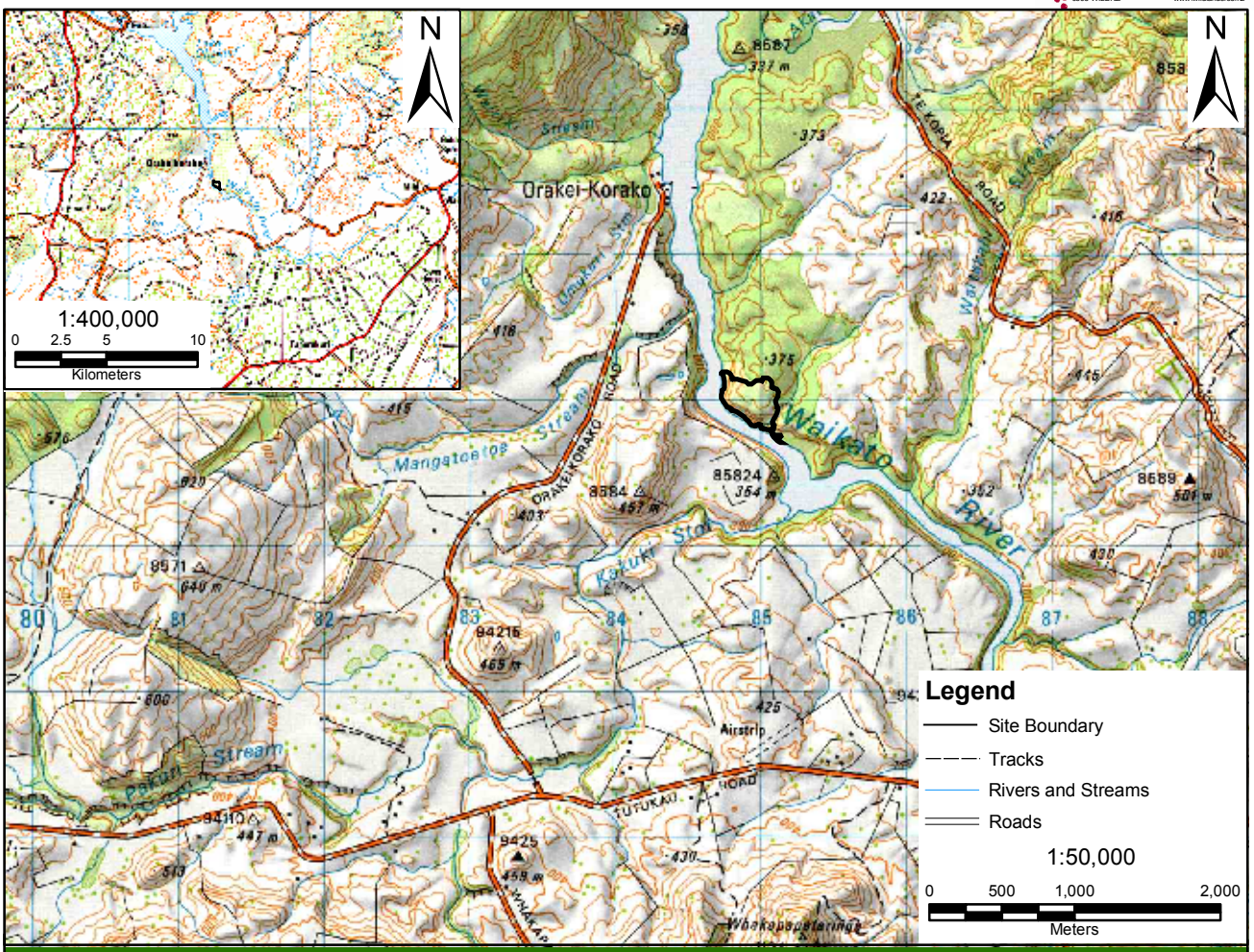
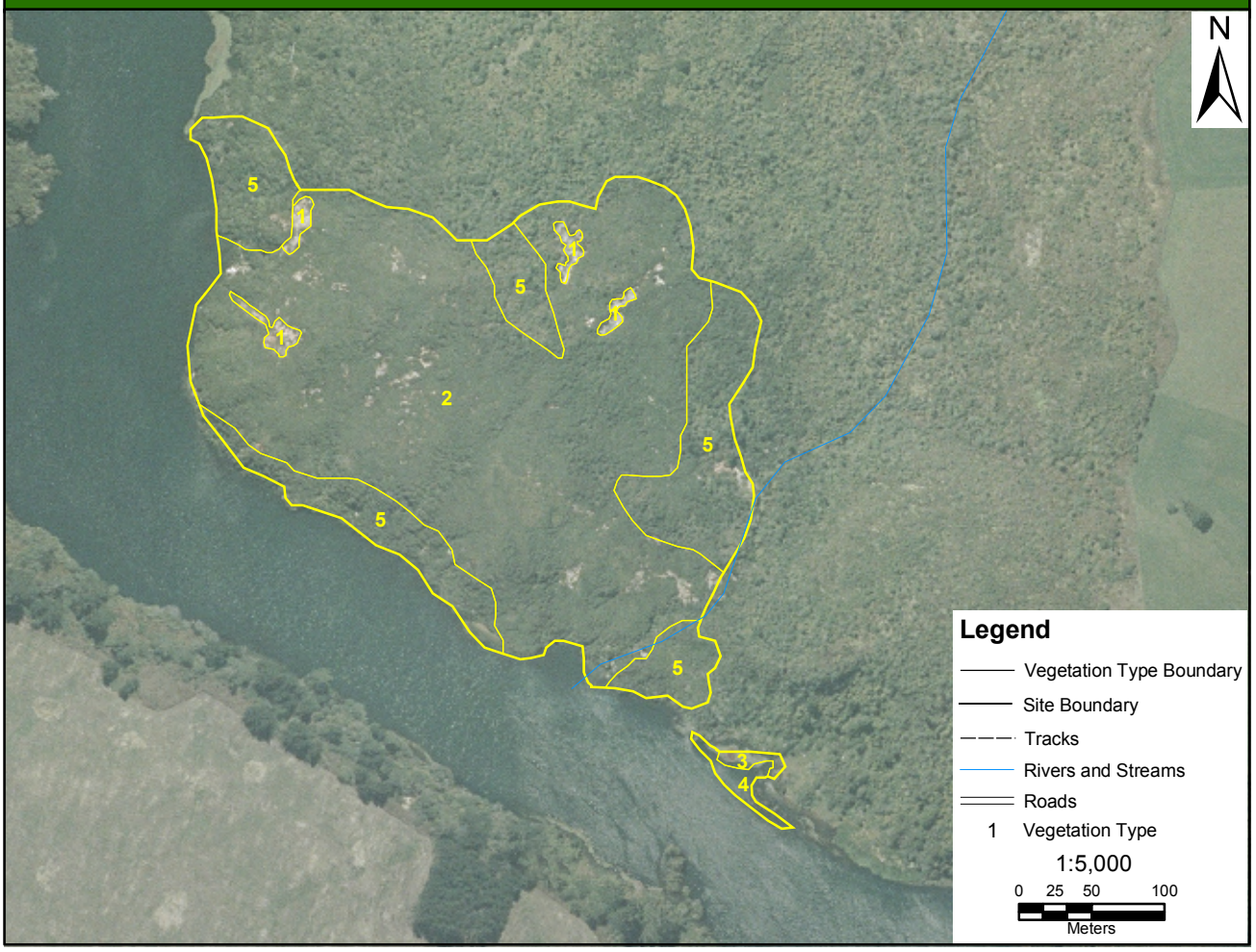
SNA 566

Red Hills Geothermal Area





Red Hills Geothermal Area

Site Number: SNA566
Ecological District: Atiamuri
Source of Information: Wildland Consultants (2004b) (Site ID U17/10); Wildland Consultants (2007b).
Digital Scale: 1:5,000
Data Source: WRAPS 2007
Regional Council: Waikato
1998 Site Number: Not in Shaw and Beadel (1998).
Current Tenure: Unprotected
Site Area: 10.2 ha
Altitude Range: 300-360 m
Bioclimatic Zone: Lowland
Grid Reference: NZTM E1874822, N5735404

VEGETATION		LANDFORM	EXTENT
CODE	TYPE		
1	Nonvegetated raw-soilfield Sinter deposits and mineral pools occur throughout this feature, with some geysers along the lake edge. There are patches of bare ground, craters, steaming fumaroles, and mud pools.	Flat, hillslope	0.2 ha
2	Prostrate kanuka shrubland A low discontinuous canopy of prostrate kanuka (*c.*<0.5 m) with mingimingi and monoao scattered throughout. The groundcover comprises local patches of moss, most notably *Dicranoloma* sp., *Campylopus capillaceus* and *Lycopodiella cernua*. Local patches of mature wilding pines (mainly maritime pine) are present.	Hillslopes	7.4 ha
3	Manuka-mingimingi scrub Manuka and mingimingi are dominant, with scattered kanuka and prostrate kanuka, as well as occasional karamu and kohuhu. Emergent wilding pines (maritime pine and radiata pine) are scattered throughout. The groundcover comprises *Gleichenia microphylla,* bracken, *Paesia scaberula*, *Histiopteris incisa*, kiokio, and turutu with large local patches of *Dicranopteris linearis*. *Dicranoloma* sp. (a moss) is also abundant. Fumaroles are scattered throughout and there are several seepages which flow directly into Lake Ohakuri. Occasional Spanish heath and Chinese privet (*Ligustrum sinense*) plants are present on the margins.	Hillslopes and alluvial terraces	<0.1 ha
4	Manuka-mingimingi scrub ⇔ prostrate kanuka shrubland A mosaic of predominantly manuka-mingimingi scrub with local prostrate kanuka shrubland occurs around a small example of sinter terrace, a geyser and an outflow of hot water into the lake. A slip exposing bright red substrate is also present. Occasional maritime pines are present with occasional *Christella* sp. 'thermal' on lake margins.	Alluvial terrace	0.1 ha
5	Geothermal water	Open water	2.5 ha

Indigenous Flora: Extensive areas of prostrate kanuka and *Dicranopteris linearis* (both 'At Risk - Naturally Uncommon' in de Lange *et al*. 2009), are present at this site. At least 50 plants of *Christella* sp. 'thermal' ('At Risk - Declining' in de Lange *et al*. 2009) are present near a hot stream to the south of the site (GPS reference: E2784576 N6297092). *Campylopus capillaceus*, a characteristic plant of geothermal areas, is also present.

Fauna: Common indigenous and introduced bird species typical of the habitats are

	present including grey warbler, silvereye, fantail, Australasian harrier, spur-winged plover and Australasian magpie.
Notes on Overall Condition:	Generally the site is in excellent condition with large areas of geothermal vegetation with no pest plants. Whilst wilding pines and Chinese privet are locally prominent, few other invasive exotic plants are present.
Change Relative to 1998:	Site not identified in Shaw and Beadel (1998). Probably little change.
Threats/Modification/ Vulnerability:	***Invasive Exotic Plants*:** Wilding pines (maritime pine and radiata pine) are the main invasive exotic plant species, forming a *c.*6-25% cover. There has been extensive control of wilding pines at the site. Chinese privet is present at the camp/picnic area adjacent to the southern side of the site, and is beginning to invade the manuka-mingimingi scrub. Chinese privet currently comprises <1% cover, but could spread rapidly. ***Human Impacts*:** A large part of the site was destroyed when the waters of the Waikato River were utilised for electricity generation, and Lake Ohakuri was formed. Other direct human impacts are low, as the site is relatively inaccessible and appears dangerous. A bath with small stream diversions is present in a hot stream towards the south of the site. ***Grazing*:** Livestock don't have access to this area. ***Adjoining Land Use*:** Pine plantations and the Waikato River.
Risk Assessment:	Pest plants: Risk to site - high; Timeframes - high.
Significance Level:	National (Table 12 - Criteria 3, 5, 7, 9; Table 2 - Factors H, I).
Significance Justification:	This site, together with Orakeikorako, comprises one of the best examples of geothermal vegetation in New Zealand. Situated in the Orakeikorako geothermal field, it can be considered in conjunction with Orakeikorako, a larger site (SNA559) situated *c.*1 km to the north. The vegetation of this site is currently in better condition than Orakeikorako because of the wilding pine control at this site. Red Hills has an extensive area of prostrate kanuka shrubland ('At Risk - Naturally Uncommon'), and relatively large populations of *Christella* sp. 'thermal' ('At Risk - Declining') and *Dicranopteris linearis* ('At Risk - Naturally Uncommon').
Fieldwork Required:	No fieldwork is required. The site was most recently surveyed in 2004, and partially surveyed in 2007.
Notes:	Given (1996) assessed the botanical value of many of the geothermal sites in the Waikato Region. This site was classed as Category A - the highest category. Wilding pines and Chinese privet should be controlled. Planting or accidental introduction of potentially invasive species should be discouraged by promoting the geothermal significance of the site.
References:	Wildland Consultants (2004b, 2007b and 2007a); Beadel (1995b); Beadel and Bill (2000); Given (1996), Spring-Rice (Unpublished).