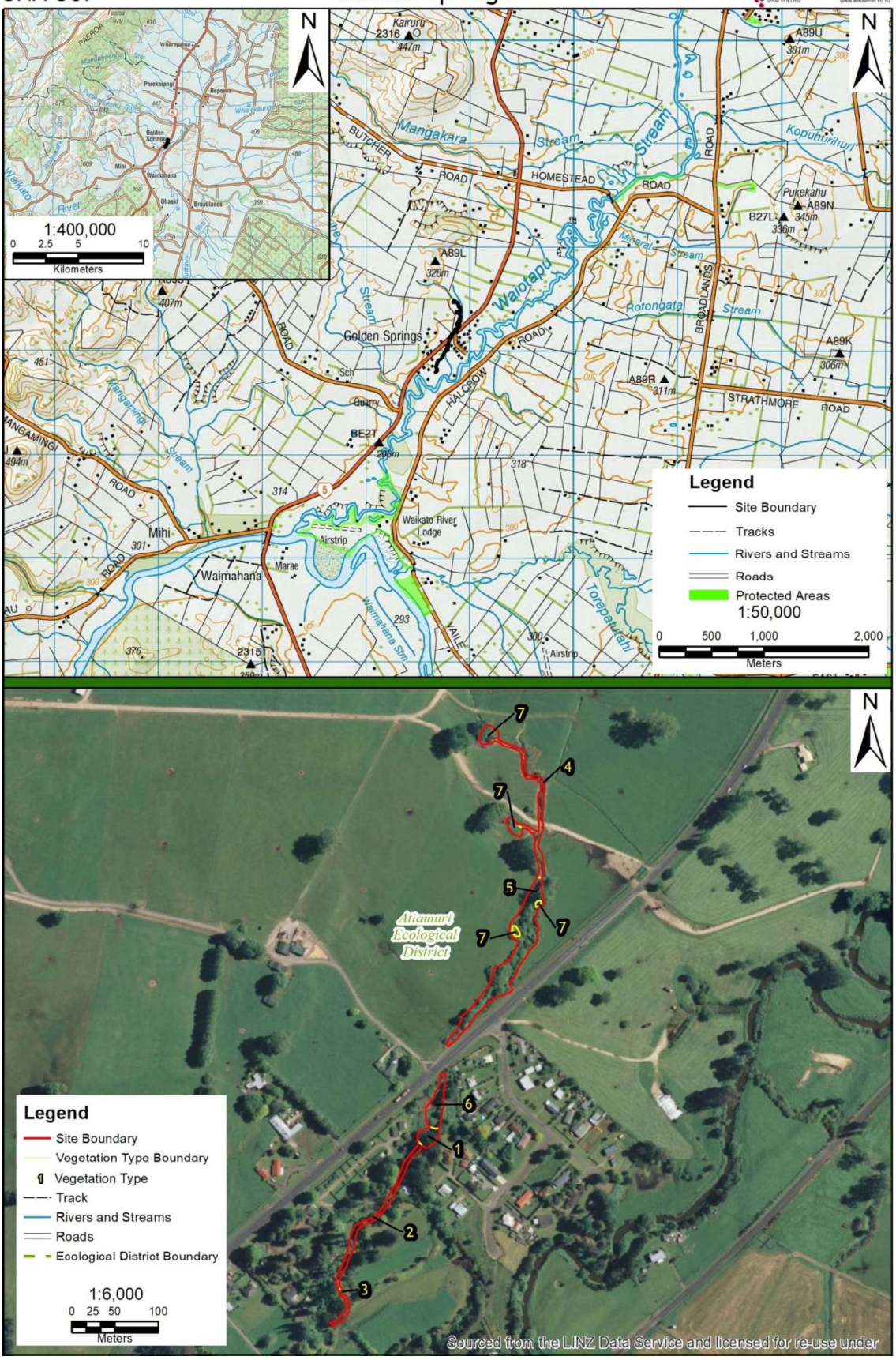
SNA 567

Golden Springs



Golden Springs

Site Number: SNA567
Ecological District: Atiamuri
Source of Information: Wildland Consultants (2014a)
Digital Scale: 1:5,000
Data Source: Bay of Plenty 0.25m Rural Aerial Photos (2015-17)
Regional Council: Waikato
1998 Site Number: This was not identified as a site in Shaw and Beadel (1998)
Current Tenure: Unprotected
Site Area: 0.8 ha
Altitude Range: 300 m
Bioclimatic Zone: Lowland
Grid Reference: NZTM E1888879, N5737251

VEGETATION		LANDFORM	EXTENT
CODE	TYPE		
1	**Prostrate kānuka scrub** A small area of prostrate kānuka to 8 m tall. Occasional Chinese privet and blackberry present.	Gully	<0.1 ha
2	**Mixed exotic and indigenous species scrub** A diverse range of vegetation occurs as a narrow band alongside the stream that flows through the Golden Springs camp ground. The heated stream creates suitable habitat for *Christella* aff. *dentata* ("thermal) with *c.*28 clumps observed during the 2014 survey. Other fern species common along the stream margin include kiokio, *Hypolepis ambigua*, *Deparia petersenii*, bracken, and water fern. Scattered planted and ornamental garden plant species are common in places (e.g. *Abelia grandiflora*, *Carex testacea*, various *Hebe* species, hydrangea (*Hydrangea macrophylla*), and *Begonia* 'semperflorens-cultorum hybrids'). Blackberry, ivy, periwinkle (*Vinca major*), and *Selaginella kraussiana*, are locally common particularly under shrubs and trees, while mown and rank grasses are common in other areas. Several prostrate kānuka plants are present. Scattered karamū, whekī, Chinese privet, silver birch, crack willow, ornamental cherry, and Douglas fir are locally emergent over the stream. *Cyperus ustulatus, Carex secta, Cyperus eragrostis,* harakeke, and lake clubrush are present on damp margins. The stream has been extensively altered in places with a diversion for water wheels, several dams, and excavations for swimming holes; channels have also been dug. There is local grassland dominated by sweet vernal, annual poa, and white clover, in association with black nightshade, broad-leaved fleabane, Scotch thistle, agapanthus (*Agapanthus praecox*), Spanish heath, Japanese honeysuckle, Chinese privet, arrow bamboo, shaking brake (*Pteris tremula*), *Hypolepis ambigua*, and swamp kiokio. One patch of *Pteris comans* was present (NZTM E1888176 N5736849).	Stream margins	*c.*0.1 ha
3	**Blackberry scrub** Chinese privet and whekī are locally emergent over stream margins dominated by blackberry scrub on the true right of the stream. A few scattered *Christella* aff. *dentata* ("thermal") are present in the upstream part of this vegetation type. Rank grasses (including Yorkshire fog, sweet vernal, and ryegrass (*Lolium perenne*)) are common on the true left. Some exotic vegetation on the true left has been cleared since 2007.	Stream margins	<0.1 ha
4	**(Grey willow)-(pampas)/tall fescue-*Cyperus ustulatus*-*Carex virgata*-blackberry grassland**	Wetland	*c.*0.1 ha

VEGETATION CODE	VEGETATION TYPE	LANDFORM	EXTENT
	Scattered emergent pampas and grey willow are present over grassland alongside geothermal streams/drains in the northeastern part of the site. The grassland is dominated by tall fescue with common Yorkshire fog, Mercer grass, and sweet vernal. Sedges are abundant on stream margins (*Carex virgata* and *Cyperus ustulatus*), and blackberry is locally abundant. Occasional creeping buttercup, broad-leaved fleabane, ring fern, and water purslane are also present. These habitats have been fenced since 2007.		
5	**(Grey willow)-(silver birch)-(tī kōuka)/raupō-blackberry reedland** A raupō and blackberry-dominated geothermal drain and wetland is located between State Highway 5 and farmland. Emergent grey willow, Chinese privet, hawthorn (*Crataegus monogyna*), cotoneaster, silver birch, tī kōuka, kōhūhū, and whekī are present. Several *Christella* aff. *dentata* ("thermal") plants were present at the south end of the drain in 2007, however none were seen in 2014. The western margin of this wetland has been fenced to exclude stock since 2007. Other species present include *Cyperus ustulatus*, Japanese honeysuckle, kiokio, pampas, and *Carex virgata*. The temperature in the drain at the southern end of this vegetation type was 40°C in 2014.	Roadside drain and wetland	*c*.0.4 ha
6	**Grey willow/raupō reedland** A small geothermal wetland is located on the eastern side of State Highway 5. Scattered grey willow are emergent over raupō-dominant reedland with local patches of *Carex virgata*, *Carex secta*, and *Hypolepis ambigua*. Blackberry is common on the margins.	Wetland	<0.1 ha
7	**Geothermal water** Geothermal hot springs and open water habitats surrounded by rank grassland species and sedgeland species. The surface temperature of the pool in the northern part of the site (NZTM E18888848 N5737470) was 40°C in 2014.	Open water	<0.1 ha

Indigenous Flora:

Christella aff. *dentata* ("thermal") ('At Risk-Naturally Uncommon) is scattered alongside stream margins throughout the eastern part of this site. A few plants of *Christella* aff. *dentata* ("thermal") were present in a roadside ditch on the western side of state highway in 2007 (Bycroft and Beadel 2007), but none were found during the 2014 survey. Bycroft and Beadel (2007) estimated that there were 45 mature plants present at this site in 2007, but only 28 clumps were recorded in the current survey. However, the cover and distribution of *Christella* aff. *dentata* ("thermal") at this site appears similar between the 2007 and 2014 surveys (Chris Bycroft pers. obs.).

A small population of geothermal kanuka (At Risk - Naturally Uncommon) is present along stream margins on the eastern side of State Highway 5. Geothermal kanuka is endemic to geothermal habitat in New Zealand.

Fauna:

No threatened or at risk bird species as listed in Robertson *et al*. 2013 have been recorded from this site.

Indigenous birds recorded from the site include North Island fantail, silvereye, bellbird, spur-winged plover, and pukeko. Introduced species recorded from the site include Eurasian blackbird, mallard, house sparrow, and yellowhammer. Other common indigenous and introduced bird species typical of the habitat are likely to be present. An indigenous butterfly, the red admiral

butterfly, was also recorded from the site.

Notes on Overall Condition:

This site is generally in poor ecological condition, and pest plants are common on both sides of State Highway 5. The condition on the western side of State Highway 5 has improved since the 2007 survey - the geothermal springs and wetland areas have been fenced to exclude stock. The parts on the eastern side of the road are within a camping ground, and their condition is directly affected by management of recreational activities and aesthetic plantings. The downstream (southern) end of the site is overrun with blackberry and is partly grazed by stock. Exotic plantings are common along the length of the stream.

Change Relative to Shaw and Beadel (1998):

Not identified in Shaw and Beadel (1998). There has however probably been a continued degradation of habitats at this site since 1998.

Threats/Modification/ Vulnerability:

***Invasive Exotic Plants*:**
Western side of State Highway 5: Grey willow (25% cover), Chinese privet (15% cover), blackberry (25% cover), cotoneaster (1% cover), pampas (1% cover), and Japanese honeysuckle (1% cover).

Eastern side of State Highway 5: Blackberry (35% cover), Chinese privet (15% cover), ivy (5% cover), periwinkle (2% cover), *Clemetis flammula* (1% cover), *Selaginella kraussiana* (2% cover), Japanese honeysuckle (1% cover), ornamental cherry (1% cover), arrow bamboo (2% cover), crack willow (1% cover), Himalayan honeysuckle (1% cover), grey willow (1% cover), *Calystegia silvatica* subsp. *disjuncta* (<1% cover), Douglas fir (<1% cover), silver birch (<1% cover), *Cyperus eragrostis* (<1% cover), agapanthus (2% cover), elephants ear (<1% cover), and *Pteris comans* (<1% cover).

***Human Impacts*:**
Western part: Although the western part of the site is farmed, the geothermal features have recently been fenced to exclude stock. Some pools on the western side are used for swimming, but the impacts on vegetation from recreational use are minor. Drains have been dug in the western part of the site and alongside State Highway 5.

Eastern part: The eastern part is negatively impacted by recreation use and aesthetic plantings. Impacts on the stream and margins include concreted sections, water wheels, and damming of stream for swimming holes. Exotic plantings are abundant on stream margins, and mowing has occurred close to stream margins in some sections.

***Grazing*:**
Western part: The western part of the site is surrounded by farmland, however the geothermal features have recently been fenced to exclude stock, and stock are now having no direct grazing impacts on geothermal vegetation.

Eastern part: The eastern part of the site is a camping ground. The manager occasionally lightly grazes this part with goats.

Risk Assessment:

Grazing: Risk to site - low; Timeframe - low.
Pest plants: Risk to site - medium; Timeframe - medium.
Mowing of stream margins: Risk to site - high; Timeframes - medium.

Significance Level:

This site has been divided into two parts for ranking - A and B (see accompanying map).
A. Regional (Appendix 7 - Table 1 - Criterion 3, 5; Table 2 - Factor L).

B. Local (Appendix 7 - Table 1 - Criterion 3, 5; Table 2 - Factor S).

Significance Justification:

A. This part of the site is of regional significance because it supports a population of 'At Risk' species - *Christella* aff. *dentata* ("thermal"). This species is only known from 15 sites in the North Island, and many populations are threatened by grazing, human induced changes to geothermal fields (e.g. energy production), and vegetation clearance. It has become extinct at four sites.

B. This part of the site is of local significance because it contains geothermal stream margin habitat - a nationally uncommon habitat (Williams *et al.* 2007, Holdaway *et al.* 2012).

Field Work Required: No fieldwork required.

Notes: Given (1996) assessed the botanical value of many of the geothermal sites in the Waikato Region. This site was classed as Category B - the second highest category.

The fences should be maintained at the site. There are significant opportunities for ecological restoration around stream margins, other areas of open geothermal water, and geothermal wetlands.

References: Given (1989a, 1995 & 1996); Spring-Rice (1996); Beadel and Bill (2000); Bycroft and Beadel (2007); Wildland Consultants (2004c, 2007a, 2007b, 2009, 2012, & 2014).