

Native Habitats Tasman

Site Assessment Report

Site No B34

Property Name Reservoir Creek

Landowners/Occupiers Tasman District Council

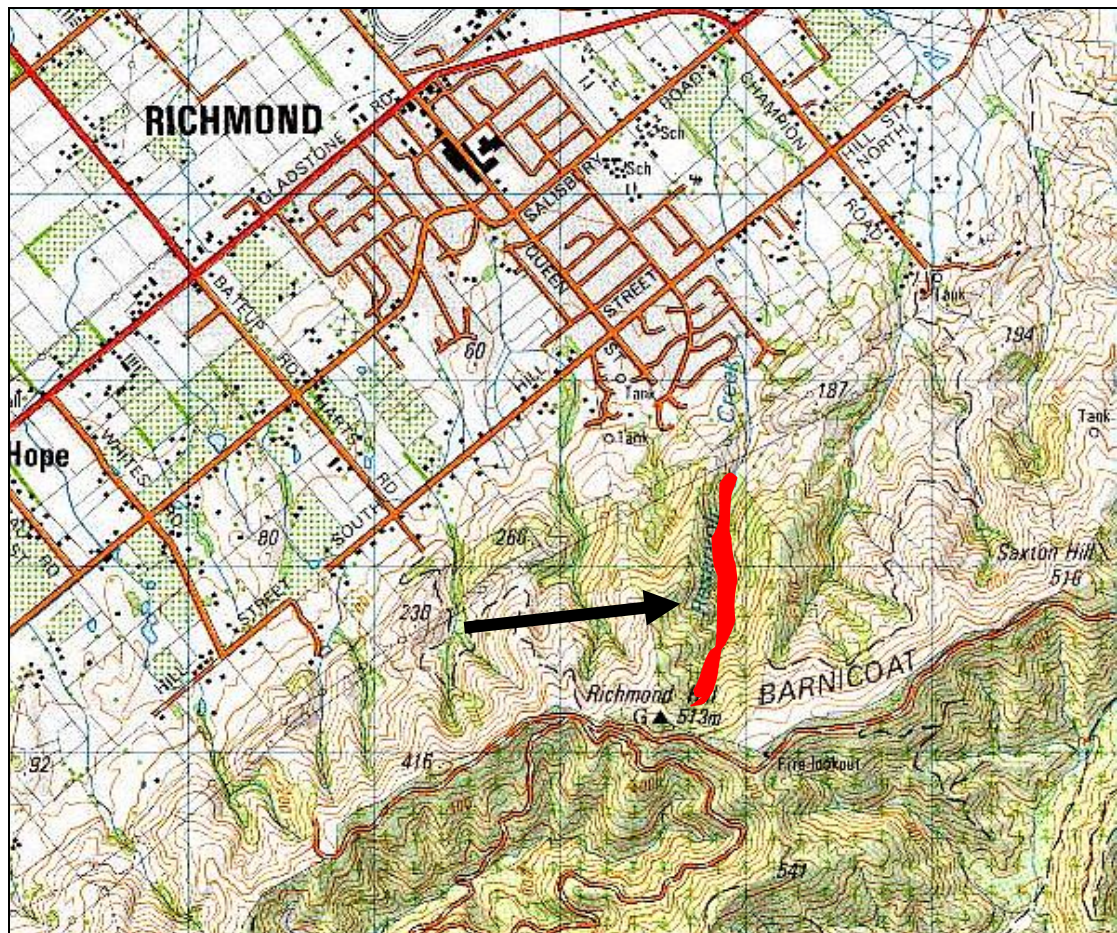
Ecological District Bryant

Grid Ref N27 268828

Surveyed By Michael North

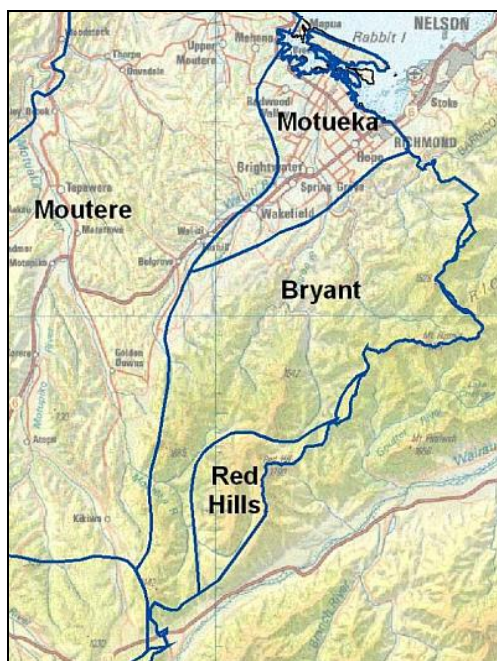
Date 28 October 2008

Survey time on site 5 hrs



The Setting - Bryant Ecological District (ED)

(Information copied from the TDC report 'Tasman District Biodiversity Overview' 2004)



Only that part of Bryant ED within TDC is illustrated – the remainder runs northward through the Nelson City Council area

Location and physical description

This ecological district is made up of steep hill country, rising to over 1600m and draining to the NW. It has complex geology, including Permian sandstone and argillite, nationally important areas of ultramafic rocks, volcanic rocks, greywacke and fossil-bearing marine and non-marine sedimentary rocks spanning a considerable age range. Soils vary greatly in structure and fertility accordingly. The climate is generally sunny and sheltered, with very warm summers, mild winters and moderate rainfall, although it is cooler and wetter in the south. Lower slopes are typically farmed or in exotic forestry. The northern part of the ecological district has a coastal portion featuring Nelson City, the Nelson Boulder Bank, its associated estuary and hilly hinterland, but this part is not within Tasman District. Tasman District Council has some land holdings in this ecological district.

Ecosystem types originally present

Formerly the ecological district below the bushline (about 1200-1300m) would have been almost entirely covered in forest apart from the waterways. The alluvial valley flats and terraces supported towering podocarp forests of totara, matai, rimu, miro and kahikatea. On the hills was mixed beech-podocarp forest, in which black beech was dominant in drier sites and hard beech in wetter lowland places, whilst red beech and silver beech occupied most cooler and mid-altitude slopes. Mountain beech was dominant on upland slopes, along with southern rata, Hall's totara and pahautea (mountain cedar). In sheltered coastal gullies were pockets of lush broadleaved forest containing tawa, titoki, pukatea, nikau, hinau and tree ferns, accompanied by large podocarps. On the ultramafic areas was distinctive forest and shrubland,

stunted by the unusual soil conditions and containing species found nowhere else. Above the bushline was tussock grassland, subalpine shrubland, herbfield and fellfield. Freshwater wetlands occurred in the valleys and would have included fertile lowland swamps with kahikatea, harakeke, cabbage tree and tussock sedge (*Carex secta*). Rivers and streams, including riparian ecosystems (trees, shrubs, flaxes, toetoe, etc.), would have made up an appreciable though not large portion of the district. The tabulation gives estimates of the extent of these original ecosystems.

Existing ecosystems

Most of the lowland forests and wetlands have been lost. What remains are fragments of beech forest, tiny remnants of lowland broadleaved forest and podocarp forest, and a few small freshwater wetlands. There are considerable tracts of mid-altitude forest still, accompanied by regenerating native vegetation where the former forest has been cleared or burnt. The upland forests and ecosystems at higher altitude are still present, though much diminished in ecological quality by exotic animal impact. The tabulation gives estimates of the proportions of the original ecosystems that remain.

Degree of protection

Mt Richmond Forest Park protects much of the indigenous ecosystems that remain. A little of the rest is protected within reserves and covenants. There are still considerable opportunities for further protection. The tabulation gives estimates of how much of the original and remaining ecosystems have formal protection.

INDIGENOUS ECOSYSTEMS - BRYANT ECOLOGICAL DISTRICT				
Ecosystem type	Original extent (% of ED)	Proportion of original extent remaining (%)	Proportion of original extent/remaining area protected (%)	
			Original	Remain
Coastal sand dune and flat	-	-	-	-
Estuarine wetland	-	-	-	-
Fertile lowland swamp and pond	<1	<5	<2	<20
Infertile peat bog	-	-	-	-
Upland tarn	<1	100	100	100
Lake	-	-	-	-
River, stream and riparian	1	40	?	?
Lowland podocarp forest	5	1	<1	70
Lowland broadleaved forest	2	<5	<1	20
Lowland mixed forest	20	5	2	40
Lowland beech forest	25	15	8	50
Upland beech forest	35	30	25	80
Subalpine forest	2	70	70	100
Lowland shrubland	1	<10	<5	50
Upland/subalpine shrubland	2	70	70	100
Frost flat communities	-	-	-	-
Tussock grassland	3	100	100	100
Alpine herbfield and fellfield	2	100	100	100

Site description

This c12ha site runs from 120-460m asl up a long steep narrow north-facing gully almost to the crest of the Barnicoat Range, just behind Richmond. The geology is Triassic Maitai Group sedimentary deposits of sandstone and siltstone with conglomerate lenses.

Vegetation

The site supports quite a number of communities, partly because of the large altitudinal range, but also because of the effects of human disturbance. Broadly, the gully bottom is largely of relatively undisturbed broadleaved forest associations with occasional podocarp and rare beech species. It may have been selectively logged in the past, but it is not clear. The side-slopes away from the gully support a range of secondary broadleaved forest and scrub/shrubland communities that would once have supported matai, black beech and lowland totara forest rising into hard beech forest.

1 Titoki-mahoe-pigeonwood gully forest (+-tawa)

A mature titoki-mahoe canopy dominates the the lower to mid gully, with pigeonwood locally common and tawa present and dominant for a short section. Kaikomako is occasional throughout. Rare emergent lowland totara and matai, with two kahikatea and one miro occur here. Generally the canopy casts a dense shade with resultant open understories, although supplejack vines are abundant. In areas where canopy breaks occur there is much canopy regeneration as well as abundant kawakawa. Pate is locally common and large leaved coprosma occasional. Ground cover is generally lush and dominated by ferns. Bedrock faces near the creek and some trunks are festooned with *Microsorium scandens* and *Blechnum filiforme*, whilst hen&chickens fern and *Blechnum chambersii* are common among others close to the creek. Kieke forms locally common thickets, and occasionally climbs trunks. There is good young regeneration of broadleaved species such as titoki and kaikomako in places. In the mid section of the gully nikau <3m becomes very common, but is curiously absent elsewhere. The largest podocarps support kieke, *Collospermum hastatum*, leather leaf fern, *Asplenium polyodon* and puka among others. Old man's beard and banana passionfruit are occasional but become commoner on the side-slope fringes; both reach into the canopy in a few places.

2 Mahoe-pigeonwood gully forest

Toward the upper gully the canopy becomes dominated by these two trees, with occasional kaikomako. Interestingly there is a small patch of tawa at its upper limit just below the new logging road. Understories and ground cover are more open than lower in the gully. Much supplejack is present, with scattered kawakawa, and pate close to the creek. Fern growth is moderate to sparse with hen&chickens fern, *Pneumatopteris pennigera* and *Blechnum chambersii* most prominent.

3 Mahoe gully forest

The top end of the gully is a simple forest of mahoe, with very open lower tiers due to ungulate browse, although hen&chickens fern does still persist. Four wheki ponga occur here.

4 Titoki-mahoe side-slope forest

The true left of the lower-mid section of the gully supports stands of titoki and mahoe, with occasional pigeonwood. Low light levels support a sparse understorey with kawakawa most common. Ferns include velvet fern,

hen&chickens and shining spleenwort. This may be primary forest or mature secondary forest.

5 Mahoe-mixed broadleaved side-slope forest (+-kanuka) associations

Elsewhere, forested side-slopes support variable associations of mahoe, pigeonwood, lemonwood, with occasional hinau, kaikomako, heketara and broadleaf, and rare lancewood, red beech and black beech. Locally there is good matai pole regeneration. Rangiora, kawakawa and ponga are locally common in places, depending on aspect. Large-leaved coprosma show signs of heavy browsing and recovery. Fern growth is particularly lush with shining spleenwort, hen&chickens and houndstongue most notable.

6 Lemonwood side-slope/gully head forest

The top end of the site is dominated by lemonwood forest with variable amounts of mahoe, and scattered matai pole regeneration. Heavy ungulate browse has impacted heavily on palatable species such as hen&chickens fern and large leaved coprosma that would otherwise be abundant, and the understorey is very open. Pine logging disturbance appears to have allowed some recent recovery locally.

Botanical Values

Communities

Gully forest rich in titoki (and tawa) is considered a rare community in Bryant ED, with scattered large podocarps adding considerably to its ecological interest. Titoki rich gully forest is probably depleted to <5% of its original cover in the ED. The gully also spans 340m in altitude, which is very large for a forested gully remnant in Bryant ED at this low altitude. From a local perspective the site is the best remaining example of gully forest on the northern faces of the Barnicoat Range and forms part of a network of about six closely lying gully sites south of Richmond.

The size of two of the podocarp trees is remarkable, with both one lowland totara and one kahikatea of c1.8m dbh, located within 100m of one another. This is by far the largest dbh lowland totara recorded to date in the Bryant ED, and the second largest kahikatea (from Nelson City Council SNA survey data).

Species

79 indigenous species were noted, a moderately high number for such a site in the Bryant ED. Two fern species are rare in Bryant ED. Four wheki ponga/*Dicksonia fibrosa* occur at the very top of the site in the hollow of the gully. One patch of jointed fern/*Arthropteris tenella* was noted on bedrock beside the creek. It is coastal fern in Tasman Bay and this is a remarkable inland record for the species.

Lowland totara is at risk of extinction in the northern (NCC administered) half of the Bryant ED through recruitment failure, but to what extent this applies to the TDC portion remains to be determined.

The fern *Leptolepia novae-zelandiae* is scarce in Bryant ED.

Fauna

Tui were scattered through the site, with waxeye, grey warbler and fantail not uncommon. One kereru was noted and a pair of kotare/kingfisher was present at the very top of the site.

Weed and animal pests

The reserve is assailed on all sides with banana passionfruit and old man's beard, although their impact on the gully bottom vegetation is only locally heavy (banana passionfruit climbs into some high podocarp canopies) and there are sections of the gully bottom where these weeds are rare or absent. The slopes above the gully bottom become increasingly infested with these exotic lianes with vast swathes of both species across low mahoe canopies or in more open gorse-mahoe shrublands.

Climbing alstromeria is common along the forest fringes in at least the middle section of the site. It is a moderately impacting vine, not in the same class as the other vines present. Nevertheless it is invasive and damaging to native vegetation and is difficult to kill due to its extensive tuber system. It is spread by birds, and with such a large population here, will act as a source of invasion into other nearby areas (if it hasn't already)

Mature macrocarpa and radiata pine are scattered along the margins in the lower section of the site.

In the gully bottom at its lower to mid sections, there is no sign of any ungulate browse. Ungulate browse on large leaved coprosma was noted from c340m asl upward. Rising toward the top end, goat browse impacts were increasingly heavy so that at the highest elevations the understory is either lacking or shows heavy browse on recent recovery. Here too there is extensive historic browse on shining spleenwort and hen&chickens fern that has killed many of them. **Possum trunk chew is evident throughout.**

Other threats

A logging road has been cut through the top end of the site within the last year or so. It has resulted in a 50m+ swathe of native forest destruction running for 100-150m across the site.

The surrounding pines have just been logged or are about to be so. The unavoidable consequence of this is that native margins are damaged, and it opens up the native forest to weed invasion as a result of increased light and damaged margins.

General condition

The main gully bottom of mixed broadleaved forest associations is in generally very good condition in the lower to mid sections of the site. The gully bottom itself is largely undisturbed primary forest other than at its lowest end, with the slopes above largely secondary.

Weed impacts are minor to locally moderate in the gully bottom but increasingly heavy up the slopes, whilst ungulate impacts are only evident toward the top mid to upper end of the site.

Key canopy species have failed to regenerate in recent decades. These include kahikatea, miro, tawa, red beech and black beech. Matai regeneration is locally good but through large tracts, it is lacking. The three adult kahikatea are very well spaced from one another, which may partly explain the lack of recruitment. Only one miro was noted. About 10 lowland totara were noted, all reaching the canopy and varying from 20cm dbh poles to 1.8m dbh. The lack of any more recent regeneration is notable, but typical of many sites in at least the northern half of Bryant ED, where it is at risk of extinction from regeneration failure.

Landscape/Historic values

The site is visible in the distance from Whakatu Drive as a line of native amongst conifers. Otherwise it is well concealed from most vantage points in the fold of the land.

Assessment of ecological value

The following criteria are assessed:

Representativeness: *How representative is the site of the original vegetation?*

Rarity: *Are there rare species or communities?*

Diversity and pattern: *Is there a notable range of species and habitats?*

Distinctiveness/special features: *Are there any features that make the site stand out locally, regionally or nationally for reasons not addressed by the above criteria?*

Size/shape: *How large and compact is the site?*

Ecological Context: *How well connected is the site to other natural areas, to what extent does the site buffer and is buffered by adjoining areas, and what hydrological services to the catchment and critical resources to mobile species does it provide?*

Sustainability: *How well is the site able to sustain itself without intervention?*

Site Significance

The technical assessment of significance is tabled in the Appendix.

This site is partly significant and partly not significant for the following reasons:

The more mature main gully bottom and lower side-slopes in the lower section have moderately high representativeness and rarity values that in combination qualify these areas for significance. The younger secondary forest areas have much lower values for the primary criteria (representativeness, rarity and diversity/pattern) and require strong support from the secondary criteria to attain significance. These are insufficient to do so.

Management issues and suggestions

Clearly old man's beard and banana passionfruit invasion presents the greatest threat to the long term survival of this site. Fortunately the main gully bottom is not yet heavily infested and could be fairly readily freed of these vines. The young secondary scrub slopes above however are so heavily infested as to probably be beyond reasonable human endeavour without recourse to aerial spraying. If it were affordable this might be a legitimate option if there is a spray and method that hits the vines hard whilst leaving the native canopy fairly intact. It would be well worth attempting hand control of these vines in the gully bottom (grubbing or herbicide stump treatment) whilst acknowledging that reinvasion will be a constant problem. The closed canopy of the gully bottom does make conditions difficult for these vines to get established.

Rat and stoat trap boxes were noted throughout the site. This is a result of a welcome initiative from a local resident that TDC have supported, and there is now a small and active group involved in pest control and bird monitoring. If

pest numbers can be kept low, this will have a very beneficial effect on the native fauna and flora.

Other weeds within the site that were noted or have been reported (barberry, hawthorn, gorse, hawthorn, Himalayan honeysuckle and woolly nightshade) are not shade tolerant and are not likely to persist once a mahoe-dominated broadleaved canopy becomes established in such areas, other than for hawthorn. Myer (2007) reports shade tolerant tutsan. Blackberry is somewhat problematic at the lowest end of the site, that is disturbed by exotic tree fall and previous human activity. It would be quite a job to control this however, and the exotic vines demand far more immediate attention.

With logging operations underway around the site, there is an opportunity to have the mature conifers near the gully bottom removed at the same time. Controlled felling will have potentially less impact than having the trees eventually die and fall of their own accord, and would allow the site to return to its more natural character much sooner.

Photo Gallery



Views of the gully are hard to come by with its pine forest setting but this image does illustrate the setting and the obvious presence of large scattered conifers close to the gully bottom



Looking down the gully from about midway along the site with titoki-mahoe side-slope forest, a huge kahikatea crown to the right and a smaller miro crown to the left with festooning banana passionfruit



Mixed broadleaved forest associations characterise much of the forested parts of the slopes, here just below the new logging road



The new logging road has cut a swathe of destruction across the upper end of the forested gully with extensive rubbles spilling down into the forest below; the edge effects of opening up this area penetrate much deeper than just the area of vegetation loss



Lush low vegetation characterises areas close to the creek



Nikau regeneration is abundant along a short section of the mid gully but largely absent elsewhere



This c1.8m dbh lowland totara is the largest noted to date in the Bryant ED

An equally large kahikatea stands nearby, festooned with epiphytes and lianes



Two of the four wheki ponga noted at the very top end of the gully; it is rare in Bryant ED



The margins of the site tail off into native scrub infested with old man's beard and banana passionfruit; recent logging operations will only favour these vines with disturbance and increased light



Climbing alstromeria is well established along the margins of the central part of the site, climbing into canopies and smothering native vegetation



An active programme of rat control is underway throughout the gully, initiated by a local community group and supported by TDC



The reservoir that gives the creek its name adds interest to the area and is of some historical interest

APPENDIX

Technical Assessment of Site Significance

Each site is ranked by the following criteria, with these rankings combined to determine whether a site passes the threshold for significance. With regard to representativeness, it should be noted that each site is ranked according to the highest ranking vegetation community or habitat that occurs within it. However a site will be divided into more than one area with each area assessed independently if they vary markedly in character, size or condition. Some examples are:

- a core area of vegetation (say a podocarp gully remnant) is surrounded by/adjoins a much larger area of markedly different vegetation (say kanuka scrub).
- a core area of vegetation has markedly different ecological values to the surrounding/adjacent vegetation.
- where artificially abrupt ecological boundaries occur between an area of primary vegetation and a surrounding/adjacent area of secondary vegetation.

Where such division of a site into two or more separately assessed components occurs, adjoining components will also be considered in their buffering/connectivity roles to one another.

In line with the above considerations this site has been assessed as two areas, the core mature forest gully bottom, and the surrounding and higher elevation low secondary forest.

SITE EVALUATION UNDER THE SIGNIFICANCE CRITERIA Mature forest communities (1,2 & 4)		
	Score	Example/explanation
PRIMARY CRITERIA		
Representativeness		
The site includes mature secondary vegetation that strongly or moderately strongly resembles pre-human natural regeneration	MH	Titoki-mahoe side-slope forest is mature but may be secondary
The site includes primary vegetation that moderately resembles its original condition.	MH	The gully bottom is probably modified primary forest
Rarity	H	
The site includes a primary community depleted 5% or less of original pre-human cover in the Ecological District, unless in poor condition	H	Titoki rich gully forest with emergent podocarps
The site supports species of unusually large stature/great age	M	Trees of exceptional girth include one lowland totara and one kahikatea both of c1.8m dbh
The site supports a species rare in the Ecological District (ED)	M	Jointed fern
Diversity and Pattern	M	
The site contains a reasonable example of its kind of an intact sequence of ecological features or gradients	M	The site spans a large altitudinal range

Indigenous plant communities species or habitats are present with typical diversity for such sites in the Ecological District	ML	
SECONDARY CRITERIA		
Ecological Context (highest score)	H	
Connectivity/Buffered by		
The site adjoins indigenous vegetation and is very well connected to, and therefore very well buffers, such vegetation	H	>1/2 of the site boundary is connected to indigenous vegetation on adjoining title(s) or adjoining but separately assessed parts of the same title
Buffering		
The site is surrounded by a deep buffering margin of vegetation	H	A wide margin of scrub or forest surrounds/almost surrounds the site
Provision of critical resources to mobile fauna		
The site provides seasonally important resources for indigenous mobile animal species and these species are present in the locality even though they may not have been observed at the site	ML	Unusually important stands of podocarp, tawa, pigeonwood or kowhai trees that provide a seasonally important benefits for forest birds.
Hydrological services to the catchment		
The site provides hydrological services to the catchment	M	This part of the site buffers Reservoir Creek for about 1km of its length
Size		
The site is of moderately large size for its plant community and Ecological District but is not compact	M	
OTHER CRITERION		
Sustainability (average score)	M	
Physical and proximal characteristics		
Size shape buffering and connectivity provide for a moderate overall degree of ecological resilience	M	Size ML Shape L Buffering H Connectivity H
Inherent fragility/robustness		
Indigenous communities are inherently resilient	H	
Threats (lowest score taken; low score = high threat)		
Ecological impacts of grazing, surrounding land management, weeds and pests*	M	Grazing H Surroundings MH (periodic logging impacts) Weeds M Pests H

*observed pest impacts only

SUMMARY OF SCORES	Criterion	Ecological District Ranking
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Primary Criteria	Representativeness Rarity Diversity and pattern	MH H M
Secondary Criteria	Size/shape Ecological context	M H
Additional Criterion	Sustainability	M

H=high MH=medium-high M=medium ML=medium-low L=low

If a site scores as highly as the combinations of primary and secondary scores in the table below, it is deemed significant for the purposes of this assessment.

	Primary Criteria		Secondary Criteria
	Any of the 3 primary criteria with a score at least as high as listed	&	Any of the 2 secondary criteria with a score at least as high as listed
1	H		-
2	2x MH		-
3	MH + M		-
4	MH	&	MH
5	2x M	&	H
6	2x M	&	2x MH
7	M	&	H + MH

Is this part of the site 'significant' under the TDC SNA criteria? YES

SITE EVALUATION UNDER THE SIGNIFICANCE CRITERIA Secondary forest communities (3, 5 & 6)		
	Score	Example/explanation
PRIMARY CRITERIA		
Representativeness		
The site contains secondary (regenerating) vegetation that moderately resembles pre-human natural regeneration	M	Egs. 1 Young regenerating forest with presence of beech or podocarps even as seedlings, good structural and functional diversity, and no more than moderate herbivore impacts. 2 Mature secondary vegetation in moderate condition.
Rarity		
No threatened, rare, distinctive or locally endemic species or communities were observed <i>nor are likely</i> to be present	L	
Diversity and Pattern		
Indigenous plant communities species or habitats are present with typical diversity for such sites in the Ecological District	ML	Indigenous plant communities species or habitats are present with typical diversity for such sites in the Ecological District
SECONDARY CRITERIA		
Ecological Context (highest score)	H	
Connectivity/Buffered by		
The site adjoins indigenous vegetation and is well connected to, and therefore well buffers such vegetation	MH	>1/3 of the site boundary is connected to indigenous vegetation on adjoining title(s) or adjoining but separately assessed parts of the same title
Buffering		
The site is surrounded by a deep buffering margin of vegetation	H	A wide margin of scrub or forest surrounds/almost surrounds the site other than when surrounding pines have recently been harvested
Provision of critical resources to mobile fauna		
The site provides seasonally important resources for indigenous mobile animal species and these species are present in the locality even though they may not have been observed at the site	L	
Hydrological services to the catchment		
The site provides hydrological services to the catchment	L	
Size		
The site is of moderate size for its vegetation community and Ecological District but is not compact	ML	
OTHER CRITERION		
Sustainability (average score)	M	
Physical and proximal characteristics		
Size shape buffering and connectivity provide for a moderate overall degree of ecological resilience	M	Size M Shape L Buffering H

		Connectivity MH
<i>Inherent fragility/robustness</i>		
Indigenous communities are inherently resilient	H	
<i>Threats (lowest score taken; low score = high threat)</i>		
Ecological impacts of grazing, surrounding land management, weeds and pests*	ML	Grazing H Surroundings MH (periodic logging impacts) Weeds ML Pests H

*observed pest impacts only

SUMMARY OF SCORES	Criterion	Ecological District Ranking
Primary Criteria	Representativeness Rarity Diversity and pattern	M L ML
Secondary Criteria	Size/shape Ecological context	ML H
Additional Criterion	Sustainability	M

H=high MH=medium-high M=medium ML=medium-low L=low

If a site scores as highly as the combinations of primary and secondary scores in the table below, it is deemed significant for the purposes of this assessment.

	Primary Criteria		Secondary Criteria
	Any of the 3 primary criteria with a score at least as high as listed	&	Any of the 2 secondary criteria with a score at least as high as listed
1	H		-
2	2x MH		-
3	MH + M		-
4	MH	&	MH
5	2x M	&	H
6	2x M	&	2x MH

7	M	&	H + MH
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Is this part of the site 'significant' under the TDC SNA criteria? **NO**

Species List

r=rare o=occasional m=moderate numbers ml= moderate numbers locally c=common
lc= locally common f=frequent lf=locally frequent x=present but abundance not noted

Species Name	Common Name	Status
Trees Shrubs		x
<i>Alectryon excelsus</i>	titoki	c
<i>Aristotelia serrata</i>	wineberry	r
<i>Beilschmiedia tawa</i>	tawa	ml
<i>Brachyglottis repanda</i>	rangiora	m
<i>Carpodetus serratus</i>	putaputaweta, marbleleaf	o
<i>Coprosma grandifolia</i>	large leaved coprosma	m
<i>Coprosma rhamnoides</i>		o
<i>Coprosma robusta</i>	karamu	r
<i>Cordyline banksii</i>	forest cabbage tree	r
<i>Dacrycarpus dacrydioides</i>	kahikatea	r
<i>Elaeocarpus dentatus</i>	hinau	r
<i>Fuchsia excorticata</i>	tree fuchsia	o
<i>Griselinia littoralis</i>	broadleaf	o
<i>Griselinia lucida</i>	puka	r
<i>Haloragis erecta</i>		r
<i>Hedycarya arborea</i>	pigeonwood	c
<i>Kunzea ericoides</i>	kanuka	o
<i>Macropiper excelsum</i>	kawakawa	f
<i>Melicytus ramiflorus</i>	mahoe, whiteywood	f
<i>Myoporum laetum</i>	ngaio	r
<i>Myrsine australis</i>	mapou, red matipo	o
<i>Nothofagus fusca</i>	red beech	r
<i>Nothofagus solandri</i>	black beech	r
<i>Olearia paniculata</i>	akiraho	r
<i>Olearia rani</i>	heketara	o
<i>Pennantia corymbosa</i>	kaikomako	m
<i>Pittosporum eugenioides</i>	lemonwood	lf
<i>Podocarpus totara</i>	lowland totara	o
<i>Prumnopitys ferruginea</i>	miro	r
<i>Prumnopitys taxifolia</i>	matai	ml
<i>Pseudopanax crassifolius</i>	lancewood	r
<i>Rhopalostylis sapida</i>	nikau	lc
<i>Schefflera digitata</i>	pate	lc
<i>Solanum avi/lac</i>		r
<i>Weinmannia racemosa</i>	kamahi	r
Lianes		x
<i>Clematis paniculata</i>	native clematis	o
<i>Freycinetia banksii</i>	kiekie	c

<i>Metrosideros diffusa</i>	white rata vine	m
<i>Muehlenbeckia australis</i>		o
<i>Muehlenbeckia aus x com</i>		o
<i>Parsonsia heterophylla</i>	native jasmine	m
<i>Ripogonum scandens</i>	supplejack	f
<i>Rubus australis</i>	bush lawyer	r
Dicot Herbs		x
<i>Cardamine debilis agg</i>		lc
<i>Parietaria debilis</i>		lc
<i>Ranunculus reflexus</i>		r
<i>Stellaria decipiens</i>		lc
Monocot Herbs		x
<i>Collospermum hastatum</i>		r
<i>Earina mucronata</i>	a perching orchid	r
<i>Libertia ixioides</i>	native iris	r
Grasses Sedges Rushes		x
<i>Carex forsteri</i>		ml
<i>Luzula picta</i>		r
<i>Uncinia scabra</i>	a hook grass	ml
<i>Uncinia uncinata</i>	a hook grass	ml
Ferns		x
<i>Anarthropteris lanceolata</i>	lance fern	r
<i>Arthropteris tenella</i>	jointed fern	r
<i>Asplenium bulbiferum</i>	hen & chickens fern	f
<i>Asplenium flaccidum</i>	hanging spleenwort	o
<i>Asplenium hookerianum</i>		o
<i>Asplenium oblongifolium</i>	shining spleenwort	c
<i>Asplenium polyodon</i>		r
<i>Blechnum chambersii</i>		c
<i>Blechnum filiforme</i>		lc
<i>Cyathea dealbata</i>	ponga, silver fern	lc
<i>Dicksonia fibrosa</i>	wheki ponga	r
<i>Dicksonia squarrosa</i>	wheki, rough tree fern	lc
<i>Lastreopsis glabella</i>		m
<i>Lastreopsis hispida</i>		r
<i>Lastreopsis velutina</i>	velvet fern	m
<i>Leptolepia novae-zelandiae</i>		r
<i>Microsorium scandens</i>		c
<i>Microsorium pustulatum</i>	houndstongue fern	c
<i>Pellaea rotundifolia</i>		m
<i>Pneumatopteris pennigera</i>		ml
<i>Polystichum neozelandicum</i>	a shield fern	m
<i>Pteridium esculentum</i>	bracken	lc
<i>Pteris macilenta</i>		o

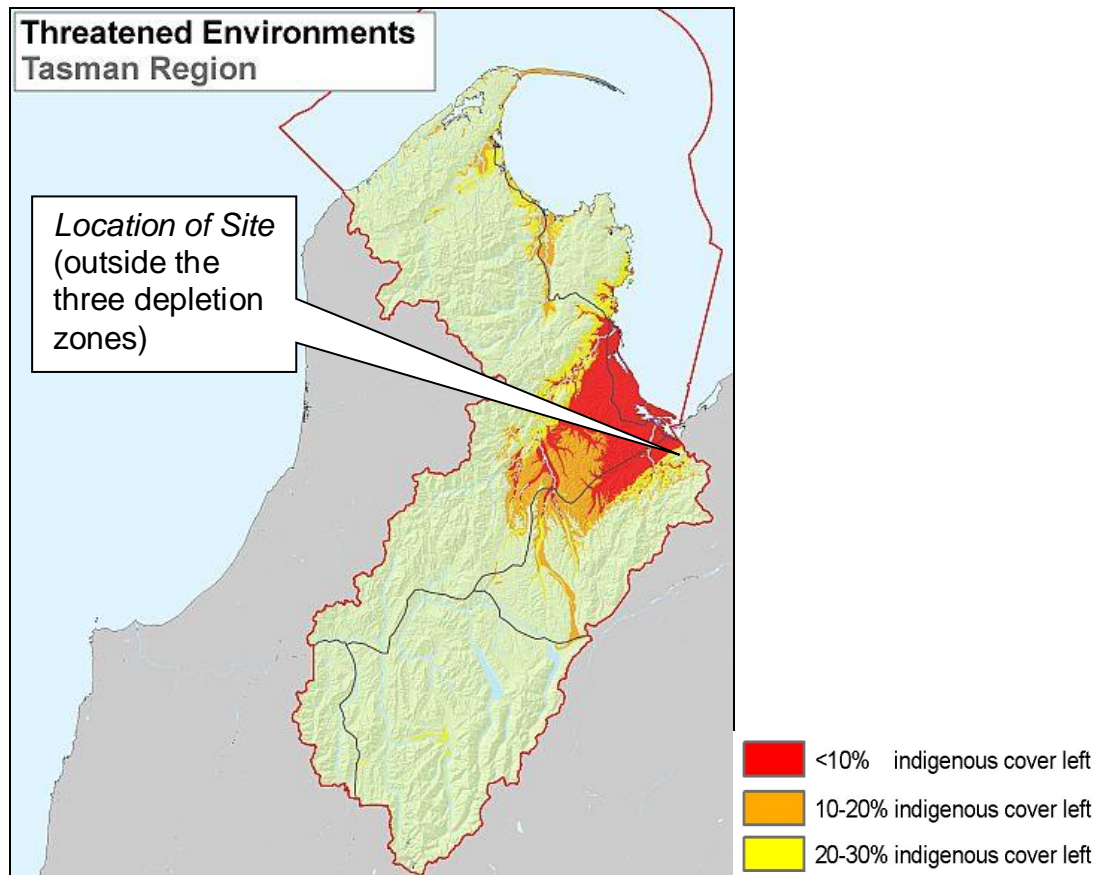
<i>Pteris tremula</i>		o
<i>Pyrrosia eleagnifolia</i>		r
Weeds		x
<i>Berberis vulgaris</i>	barberry	o
<i>Clematis vitalba</i>	old man's beard	c
<i>Mycelus muralis</i>	wall lettuce	lc
<i>Passiflora mixta/mollissima</i>	banana passionfruit	c
<i>Pinus radiata</i>	radiata pine	o
<i>Solanum nigrum</i>	black nightshade	o
<i>Solanum chenopodioides</i>		o
	unidentified liane	r
Birds		x
	tui	x
	fantail/piwakawaka	x
	waxeye	x
	grey warbler/riroriro	x
	pigeon/kereru	x
	kingfisher/kotare	x
	blackbird	x
	thrush	x
	greenfinch	x
	chaffinch	x

Land Environments of New Zealand (LENZ)

LENZ is a national classification system based on combinations of soil characteristics, climate and landform. These three factors combined are correlated to the distribution of native ecosystems and species.

When LENZ is coupled with vegetation cover information it is possible to identify those parts of the country (and those Land Environments) which have lost most of their indigenous cover. These tend to be fertile, flatter areas in coastal and lowland zones as shown in the map below for Tasman District.

Further information on the LENZ framework can be found at-
www.landcareresearch.co.nz/databases/lenz



National Priorities for Protecting Biodiversity on Private Land

Four national priorities for biodiversity protection were set in 2007 by the Ministry for the Environment and Department of Conservation.

<i>National Priorities</i>	<i>Does this Site Qualify?</i>
1 Indigenous vegetation associated with land environments (ie LENZ) that have 20 percent or less remaining in indigenous cover. This includes those areas colored in red and orange on the map above.	No
2 Indigenous vegetation associated with sand dunes and wetlands; ecosystem types that have become uncommon due to human activity	No
3 Indigenous vegetation associated with 'naturally rare' terrestrial ecosystem types not already covered by priorities 1 and 2 (eg limestone scree, coastal rock stacks)	No
4 Habitats of threatened indigenous species	No

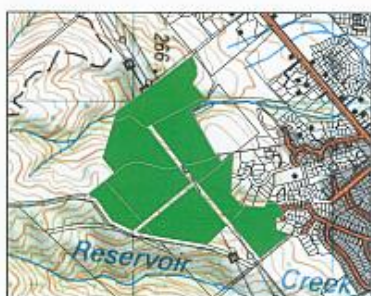
Further information can be found at -

www.biodiversity.govt.nz/pdfs/protecting-our-places-brochure.pdf

Significance of LENZ and National Priorities

What does it mean if your site falls within the highly depleted LENZ environments, or falls within one or more of the four National Priorities?

These frameworks have been included in this report to put deeper ecological context to the site. They are simply another means of gauging ecological value. This information is useful in assessing the relative value of sites within Tasman District when prioritising funding assistance. They otherwise have no immediate consequence for the landowner unless the area of indigenous vegetation is intended to be cleared, in which case this information would be part of the bigger picture of value that the consenting authority would have to take into account if a consent was required.



TDC - Reservoir Creek

B 34

Pt Sec 31 SQ 1
Pt Sec 63 SQ 1
Pt Sec 3 SQ 1
1961068902

- 1 Titoki - native-pigeonwood gully forest (± trees)
- 2 Native-pigeonwood gully forest
- 3 Native gully forest
- 4 Titoki - native side-slope forest
- 5 Native-mixed broadleaved
- 6 Leeward side-slope forest areas
- 7 Leeward side-slope + gully head forest.

1:5,000



0 50 100 150 200
m