APPENDIX G Wetland Assessment

MEMORANDUM

Bioresearches
A Babbage Company

TO:	WSP	Date:	1 October 2024
ATTENTION:	Melanya King	Job No:	67045
FROM:	Treffery Barnett, Bioresearches		

BRYNDERWYN HILLS – WETLAND

Bioresearches carried out an assessment of a wetland to inform the WSP Ecological Impact Assessment for the State Highway 1 improvements over the Brynderwyn Hills.

The wetland was part of a stream – wetland complex located in the base of a gully recently harvested for pine, designated site B1 (Figure 1).

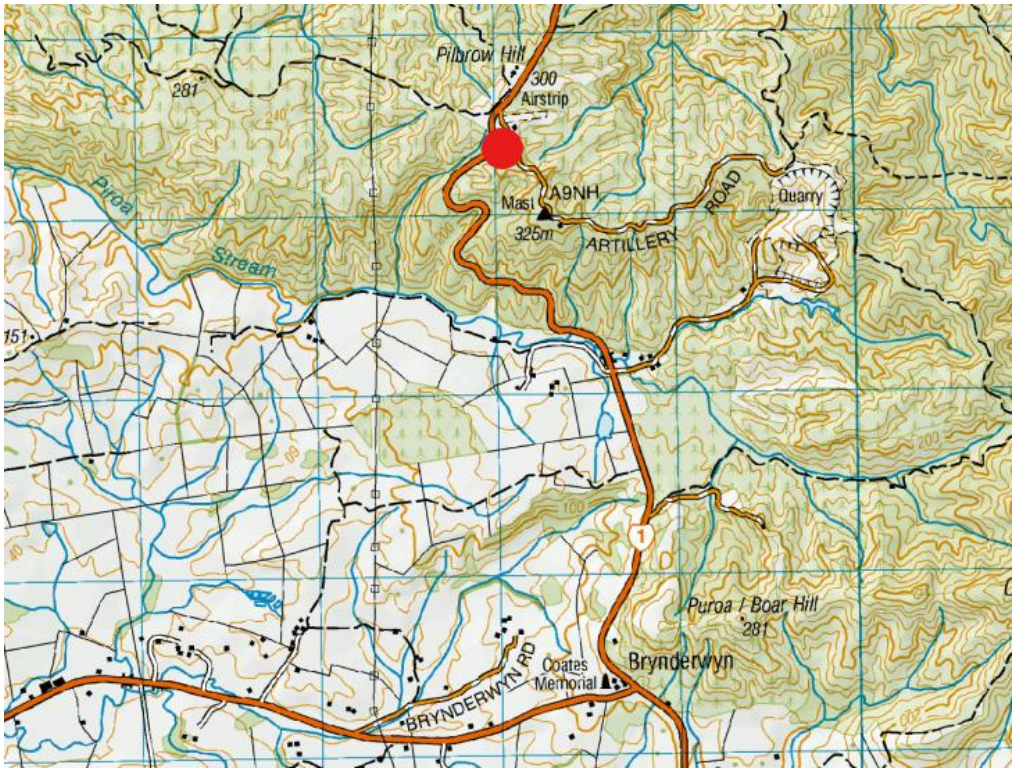

Figure 1. Location of Site B1 (red circle) on the Brynderwyn Hills

The extent of wetland in 'B1 Upstream' Gully 2 was delineated on 21 December 2023, by a Senior Freshwater Ecologist, immediately prior to works commencing.

The wetland was delineated in accordance with the Ministry for the Environment's (MfE) wetland delineation protocols (MfE, 2020), primarily based on vegetation assessments and wetland hydrology to determine whether areas met the definition of a 'natural inland wetland' under the RMA and the National Policy Statement for Freshwater Management 2020 (NPS-FM).

Bioresearches
Level 4, 68 Beach Road, Auckland 1010
PO Box 2027, Shortland Street,
Auckland 1140, New Zealand
T 09 379 9980 **F** 09 377 1170
E admin@babbage.co.nz **www.bioresearches.co.nz**

The wetland formed a mosaic covering 95m² in area. The vegetation was dominated by early successional species, that had grown on the clay slip debris that had settled on the base of the gully after the pines were harvested. A stream with several braids had developed in the slip material and wetland vegetation was present either side of the stream and in the base of the gully just prior to where the water flowed into a large vertical manhole before flowing in a culvert under State Highway 1 (Figure 2).

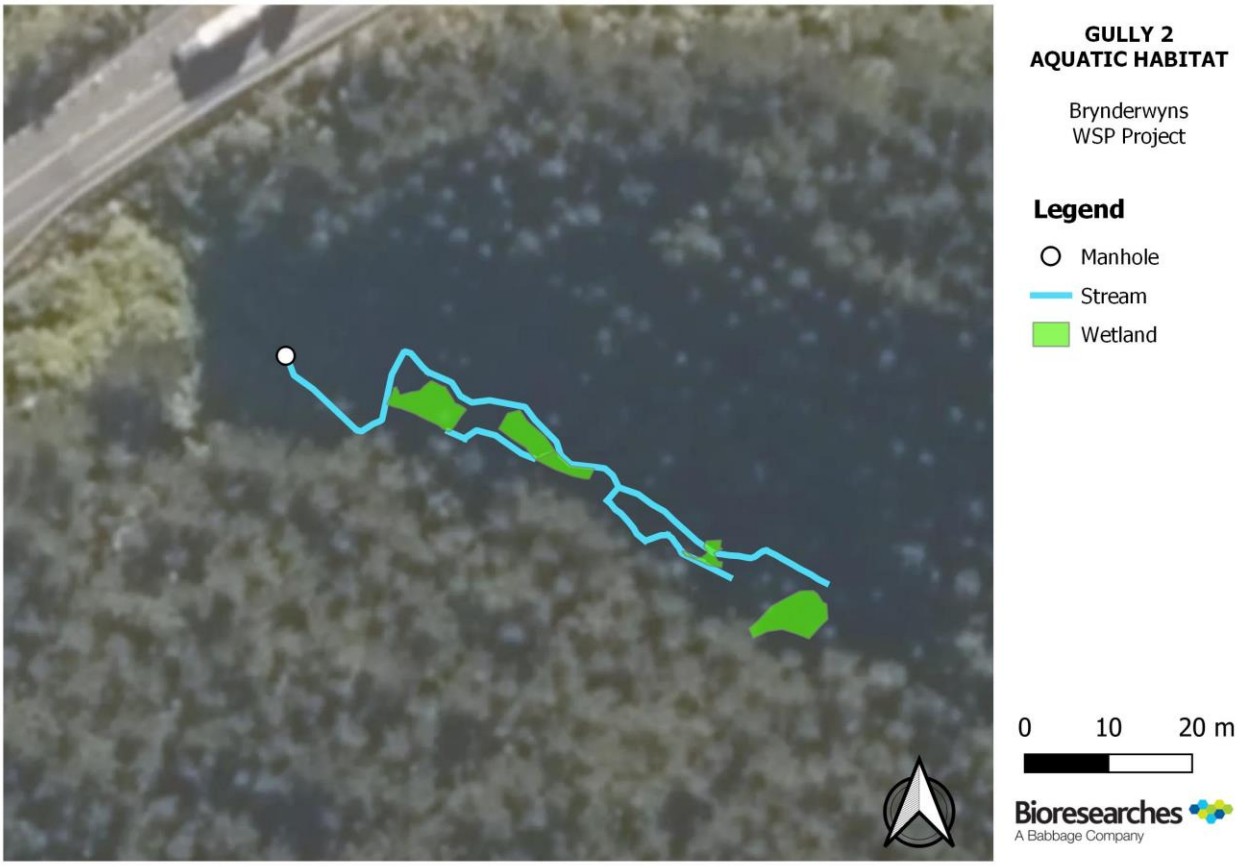

Figure 2. Gully B1 Wetland Mozaic

The extent, values and general parameters of the wetland are presented in Table 1 with a summary presented as Table 2 The wetland plot data are presented as Appendix 1.

Table 1. Gully B1 wetland parameters

Parameter	Wetland 1
Total Size (m^2)	95
Area of wetland to be lost (m^2)	95
Percent of wetland to be lost (%)	100%
Hydrosystem	Palustrine

Wetland class	Seepage
Johnson & Gerbeaux structural class	This is largely an induced wetland on slip surfaces with a cover of herbaceous plants, sedges and rushes.
Area of primary vegetation type (m^2)	95
Dominant wetland vegetation	Dominated by early colonising species found in disturbed areas: grass-leaved rush, *Juncus planifolius* (FACW); *Isolepis prolifera* (OBL); toad rush, *Juncus bufonius* (FACW); *Isolepis sepulcralis* (FAC); jointed rush, *Juncus articulatus* (FACW).  

	
Riparian buffer type, extent and condition	Consists of recently harvested pine forest, with occasional native shrubs closer to SH1. No buffering to the wetland in terms of shading or minimisation of edge effects (e.g., exposure to wind, temperature fluctuations).
Pest animal management	None currently being undertaken, so presumed high pest animal burden.
Ecological Values	*RepresentativenessI*: **Very Low**. The wetland is largely induced by human activities. Due to lack of connectivity and constant disturbance, the wetland lacks the flora and fauna characteristics of a robust wetland. The wetland appears to be intermittently saturated, and would have likely been very dry in summer months. The wetland buffer was highly disturbed. *Rarity distinctiveness*: **Very Low**. The wetland is a mosaic totalling 95m², and is a miniscule proportion of the wetlands in the ecological district. There are extensive areas of seepage wetlands in the landscape as evidence by the numerous seepage wetlands located at the base of the Brynderwyn Hills. No Threatened or At-Risk flora or fauna species were identified within the wetland. There was insufficient water within the wetland to support native fish. *Diversity & Pattern*: **Very Low**. The wetland has one dominant vegetation tier and a small species diversity, largely comprised of early colonising species of disturbed ground. The wetland also is very small and linear, which leaves it vulnerable to edge effects such as light, temperature, noise and wind. *Ecological Context*: **Low**. The wetland is isolated by the gully and the SH1. The vegetation type was uniform throughout the wetland, with a low diversity of flora present, and a single herbaceous vegetation tier, with no trees or other structural tiers present. The wetland has no effective riparian buffer, and there is no buffering from edge effects.

	Potential: **Low.** The wetland is comprised of small patches of herbaceous vegetation located within a gully head of a commercial forest, and is subject to regular commercial harvesting activities. There is no intention of protecting the habitat and it is likely that once the trees are re-established that the wetland and narrow intermittent stream will largely dry out.
Overall Ecological Value (as assigned in accordance with Table 6 in the EIANZ Guidelines (Roper Lindsay et al., 2018)	**Very Low**

Table 2. B1 Upstream wetland extent and values

Site	Ecological value	Ecological potential	Magnitude of impact	Level of impact
B1 Wetland	Very Low	Low	Very high	Low

Yours sincerely,

Treffery Barnett M.Sc. (Hons), MEIANZ
Senior Coastal & Freshwater Ecologist
T +64 9 379 9417 | **M** +64 21 285 4330 |
Bioresearches
A Babbage Company
Babbage Consultants Limited

Appendix 1 – Wetland Plot Data

PLOT DATA

	Species Code	Scientific Name	Common Name	Biostatus	Wetland Rating	Pasture species	Coverage (%)	Height (m)	Dominant Species (write 'Yes')*	Pasture species percentage (%)
Groundcover/Herb stratum	ISOsep	*Isolepis sepulcralis*	-	Exotic	FAC	No	50		Yes	
	JUNpla	*Juncus planifolius*	-	Non-Endemic	FACW	No	10			
	JUNbuf	*Juncus bufonius*	Toad rush	Exotic	FACW	No	5			
	LOTped	*Lotus pedunculatus*	Lotus	Exotic	FAC	Yes	5			5
	ANAarv	*Anagallis arvensis*	Scarlet pimernel	Exotic	FACU	No	1			
	SCHdig	*Schefflera digitata*	Patē	Endemic	FACU	No	5			
	ISOpro	*Isolepis prolifera*	-	Non-Endemic	OBL	No	20		yes	
Groundcover/Herb stratum					Bare Ground					
					Percent plant cover		96			
					Total cover		96			

Coverage amounts for checking which species are dominant:		
Canopy	50% cover is anything over:	0
	20% cover is anything over:	0
Subcanopy	50% cover is anything over:	0
	20% cover is anything over:	0
Ground cover	50% cover is anything over:	48
	20% cover is anything over:	19.2

NES-F PLOT CALCULATIONS

1. Dominance test	
A (Number of dominant species that are FAC, FACW or OBL)	2
B (Total number of dominant species)	2
Percentage of dominants	100
"The Dominance Test threshold is met if more than 50% of the dominants from all strata are OBL, FACW, or FAC (i.e. the plant community is considered hydrophytic)."	
Test Met?	Wetland

2. Prevalence Index			
Percentage cover:		Multiplier	Multiplied
OBL	20	1	20
FACW	15	2	30
FAC	55	3	165
FACU	6	4	24
UPL	0	5	0
Total percent (A)	96		
Total multiplied (B)			239
Prevalence Index (B/A)			2.49

"The Prevalence Index (B/A) threshold is met if ≤ 3.0 (i.e. the vegetation is considered hydrophytic)."

Test Met?	Wetland

Wentworth et al. (1988) cautioned that vegetation alone was not accurate between Prevalence Index values 2.5 to 3.5. In addition, a Prevalence Index is considered undependable if 20% or more of the total cover in a Sample Plot cannot be identified to the level of species (CJ Newling, pers. comm., January 2014).

Prevalence index between 2.5 and 3.5?	No

If prevalence index is between 2.5 and 3.5 consider applying the 'FAC Neutral' test. FAC Neutral test = same as dominance test but with 'FAC' species removed

3. FAC Neutral test	
A (Number of dominant species that are FACW or OBL)	N/A
B (Total number of dominant species)	N/A
Percentage of dominants	N/A
Test Met?	N/A