

Boffa Miskell



Watercourse Classifications & Freshwater Ecological Values Assessment

1 Silverwater Drive, Silverdale



Document Quality Assurance

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Prepared by:	Sarah Hockings Ecologist Boffa Miskell Limited	
	Sarah Flynn Ecologist, Principal Boffa Miskell Limited	
Reviewed by:	Lee Shapiro Ecologist, Principal Boffa Miskell Limited	
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1.0 Introduction

Boffa Miskell Ltd was engaged to undertake an ecological site survey at 1 Silverwater Drive, Silverdale (Lot 7 DP 545151) and a field survey was undertaken on 9 June, 2021 to provide updated water course classifications and freshwater ecological assessment previously reported by Bioresarches Group Limited in 2016. Resource consent BUN20460815 was granted for earthworks covering the northern third of the property in 2017, and this work is currently underway. Henceforth, this part of the property is referred to as the 'consented earthworks'.

This report pertains to the southern portion of the site not covered by the 2017 resource consent (henceforth referred to as 'the subject site'). It provides an updated description of watercourses and surrounding land, and includes an evaluation of prospective wetland features with respect to the National Policy Statement for Freshwater Management 2020 (NPS-FM) definition and protocols for identification of natural wetlands, to determine if any provisions of the recent National Environmental Standard for Freshwater 2020 (NES-F) apply.

2.0 Site Overview and Key Findings

The site walkover was undertaken on 9th June, during a period of light rain, with frequent, light to moderate rainfall in the two weeks before the survey (NIWA cliflo database¹). Our assessment focused on inspection of watercourses and flow paths and associated features within the subject site identified in Bioresarches (2016). However, the subject site was found to be heavily overgrown with kikuyu (waist-high in places) and gorse (1.5 – 2 m tall).

- All watercourses and flow paths were investigated to classify them according to the AUP(OP) criteria for permanent intermittent rivers and streams and ephemeral streams.
- The watercourses and flow paths within the site were classified as ephemeral and this is due to the stream bed being above the water table at all times and they appear to only receive surface flows.
- Two 'natural wetland' features were identified on the property using protocols set out in the NPS-FM. Feature 1 appears to be part of an ephemeral stream channel and Feature 2 appears to have established from seed that was transferred in a patch of relocated soil, and may not be a functional wetland despite the occurrence of wet-tolerant species
- A small number of mature macrocarpa trees present on site may also have potential habitat value for birds, particularly during breeding season, and this should also be taken into consideration when planning and scheduling vegetation clearance works.
- Given the presence of suitable habitat within the site and relatively close proximity of known populations of skinks and geckos, a management plan to minimise effects on native lizards in the course of development will be required.

¹ <https://cliflo.niwa.co.nz/> stations queried include Whenuapai, Whangaparaoa and Motat

3.0 Watercourses

Flow paths and other watercourses that were previously identified within the subject site in Bioresearches (2016) are overgrown by kikuyu and gorse. No flowing water was found in any watercourses, which was consistent with observations from the Bioresearches (2016) survey.

An artificial pond in the headwaters of the main tributary (immediately south of a group of macrocarpa trees) identified in the Bioresearches (2016) report was completely dry and kikuyu-covered in the recent site visit (aside from what appears to be a track around the margin), and it is possible that a bund may have been eroded away or breached at some point to allow it to drain.

There are several small flow paths that run from the eastern boundary of the site and join a watercourse that extends from the centre of the subject site to the northern boundary (adjoining the area of consented earthworks) (Figure 1). All of the watercourses and flow paths within the site were investigated to classify them according to the AUP(OP) criteria for permanent intermittent rivers and streams and ephemeral streams (Table 1).

The watercourses and flow paths comprised well-defined to deeply incised channels overgrown with kikuyu and gorse the entire cross-sectional width, no water was found in any of these channels (See Figures 2 and 3). In several locations there were deep holes (>2 m deep) within the channel of the watercourse/flow path and these also had no water in them (Figure 2d). The watercourses and flow paths within the site were classified as ephemeral and this is due to the stream bed being above the water table at all times and they appear to only receive surface flows.

Table 1. AUP(OP) criteria for permanent intermittent rivers and streams and ephemeral streams.

Criterion	Definition
Permanent river or stream	
1	Evidence of continuous flow
Intermittent river or stream, or ephemeral stream	
Ceases to flow when bed is above water table. To be intermittent, a river must exhibit at least 3 of the following	
1	Evidence of natural pools
2	Well defined channel. Banks and bed can be distinguished
3	Surface water present (more than 48hrs after a rain event)
4	Rooted terrestrial vegetation not present across the entire cross-sectional width of channel
5	Organic debris present in floodplain
6	Evidence of substrate sorting processes, including scour and deposition
Ephemeral stream	
1	Stream bed above the water table at all times.
2	Water present only during and shortly after rain fall







Figure 2a-h: Photos from watercourse investigations (locations on Figure 1) at 1 Silverwater Drive, Silverdale in July 2021

4.0 Wetland assessment

4.1 RMA and NPS-FM wetland definitions

The RMA (1991) definition of a wetland “includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions”. The National Policy Statement for Freshwater Management (NPS-FM), which sets out the policy framework for the NES-F, uses the RMA definition to describe a “**natural wetland**”, subject to the following exclusions:

- (a) a wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former natural wetland);
- (b) a geothermal wetland; or
- (c) any area of improved pasture that, at the commencement date, is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain derived water pooling.

Improved pasture is defined in the NPS-FM as an area of land where exotic pasture species have been deliberately sown or maintained for the purpose of pasture production, and species composition and growth has been modified and is being managed for livestock grazing.

Hydrophytes (hydrophytic vegetation) is defined as plant species capable of growing in soils that are often or constantly saturated with water during the growing season.

The hydrophyte categories (wetland indicator status ratings: Clarkson (2013) and subsequent updates) are:

- Obligate (OBL): occurs almost always in wetlands (estimated probability >99% in wetlands)
- Facultative Wetland (FACW): occurs usually in wetlands (67–99%)
- Facultative (FAC): equally likely to occur in wetlands or non-wetlands (34–66%)
- Facultative Upland (FACU): occurs occasionally in wetlands (1–33%)
- Upland (UPL): rarely occurs in wetlands (<1%), almost always in ‘uplands’ (non-wetlands).

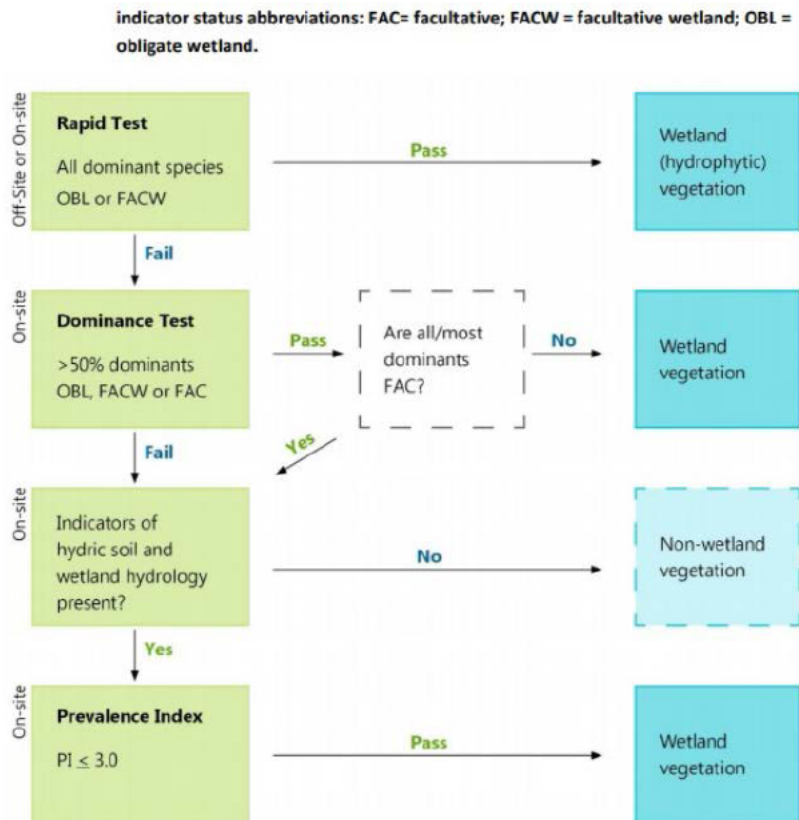


Figure 4. Key steps in hydrophytic vegetation determinations (from NPS-FM Wetland Delineation protocols).

4.2 Wetland features

The site assessment undertaken by Bioresarches (2016) noted the presence of rushes and sedges in and around the margins of watercourses and artificial ponds, which would potentially meet the definition of a natural wetland in accordance with NPS-FM protocols. However, in the absence of grazing, the swathes of kikuyu and gorse now present on the subject site have evidently overwhelmed these previously rush-dominated patches.

Field assessments by Boffa Miskell staff included inspection of areas identified as flow paths and flood-prone areas according to hydrological modelling (Auckland Council GIS viewer) to determine if these areas meet the definition of a natural wetland according to NPS-FM criteria and guidelines (Figure 4).

Two small, discrete areas with prospective wetland characteristics in the north-western corner of the subject site were distinguished by visual observation. Feature 1 appears to be a short tributary or oxbow connected to the ephemeral stream channel (Figure 5). The feature itself is within a channel with banks, though vegetation covers the bed. Vegetation met the 'dominance test' (i.e., more than half the dominant species were OBL, FACW or FAC wetland plants, Figure. 4), and while soil investigations found no hydric soils present, water was present close to the soil surface within the channel. In addition, patches of standing water were found near the northern boundary of the subject site, amongst deep kikuyu and gorse scrub, though the overgrowth of vegetation obscured the extent of wet area.

Feature 2 was located in the vicinity of an artificial pond mapped in Bioresearches (2016). This site was completely dry, but contained a small (5 – 10 m²) patch of rushes and other wet tolerant vegetation (Figure 6). This feature also met the 'dominance test', though while a ~10 – 15 cm layer of hydric soil was found in the soil profile, organic topsoil was found beneath it, indicating that this feature is likely to have been induced through soil disturbance. It is likely the surface (hydric) soil deposit contained a seedbank from a previous wet site.

A quadrat survey was undertaken in each feature to calculate the 'prevalence index' of wetland vegetation in accordance with NPS-FM protocols. Results are presented in summarised in Table 1. Both plots scored as wet-tolerant vegetation, though the score for Feature 1 was marginal (2.95 where the threshold is >3).



Figure 5 (a & b). Feature 1 vegetation and soil (high groundwater table)



Figure 6 (a & b). Feature 2 vegetation and soil (hydric soil overlying organic soil)

Table 2: Wetland survey results from field surveys using the NPS-FM wetland delineation protocols.

Feature 1 (tributary/ oxbow)

6-letter code	% Cover	Dominant (50/20 rule) Y / N	Species Name	Common Name	Wetland Status	Dominant Species is OBL, FACW, FAC	Score (Prevalence)	Points (Prevalence)
ranrep	70	Y	<i>Ranunculus repens</i>	Creeping Buttercup	FAC	Yes	3	210
hollan	15	N	<i>Holcus lanatus</i>	Yorkshire Fog	FAC		3	45
lotped	1	N	<i>Lotus pedunculatus</i>	Lotus	FAC		3	3
pasdis	10	N	<i>Paspalum distichum</i>	Mercer Grass	FACW		2	20
cencla	5	N	<i>Cenchrus clandestinus</i>	kikuyu	FACU		4	20
Dominance Test: (proportion OBL, FACW, FAC)								
Prevalence Index score:		1						
		2.95049505						

Feature 2 (disturbed soil)

6-letter code	% Cover	Dominant (50/20 rule) Y / N	Species Name	Common Name	Wetland Status	Dominant Species is OBL, FACW, FAC	Score (Prevalence)	Points (Prevalence)
juneff	25	Y	<i>Juncus effusus</i>	Leafless Rush	FACW	Yes	2	50
hollan	15	Y	<i>Holcus lanatus</i>	Yorkshire Fog	FAC	Yes	3	45
lotped	20	Y	<i>Lotus pedunculatus</i>	Lotus	FAC	Yes	3	60
ranrep	15	Y	<i>Ranunculus repens</i>	Creeping Buttercup	FAC	Yes	3	45
hyprad	1	N	<i>Hypochaeris radicata</i>	Catsear	FACU		4	4
epicin	10	N	<i>Epilobium cinereum</i>	willow herb	FAC		3	30
cencla	1	N	<i>Cenchrus clandestinus</i>	k kuyu	FACU		4	4
lolper	1	N	<i>Lolium perenne</i>	Perennial Rye Grass	FACU		4	4
trirep	1	N	<i>Trifolium repens</i>	White Clover	FACU		4	4
pasdis	5	N	<i>Paspalum distichum</i>	Mercer Grass	FACW		2	10
pasdil	5	N	<i>Paspalum dilatatum</i>	Paspalum	FACU		4	20
Dominance Test: (proportion OBL, FACW, FAC)								
Prevalence Index score:		1						
		2.787878788						

5.0 Fauna Habitat

Native skinks are known to colonise areas of infrequently disturbed rank grass if populations are present within the vicinity and the area and there are opportunities for dispersal. A search of the NZ herpetofauna database was undertaken to determine whether any known populations of native lizards are present in the surrounding area.

Prior records of five native lizard species were identified within 10 km of the site (Table 3), including two skinks and three geckos (arboreal lizards). Three of these species are classified 'At Risk- Declining' and one 'At Risk- Relict'.

Given the presence of suitable habitat within the site and relatively close proximity of known populations of skinks and geckos, a management plan to minimise effects on native lizards in the course of development will be required.

A small number of mature macrocarpa trees present on site may also provide potential habitat value for birds including white faced heron, kingfisher and ruru, particularly during breeding season, and this should also be taken into consideration when planning and scheduling vegetation clearance works.

Table 3. Herpetofauna within 10km radius of 1 Silverwater drive, Silverdale.

Species	Common name	Threat Classification	Distance from site	Habitat Use
Oligosoma ornatum	ornate skink	At Risk -Declining	1.3 Km	Grassland, scrubland, forest
Oligosoma aeneum	copper skink	Not Threatened	1.5 Km	Grassland, scrubland
Mokopirirakau granulatus	forest gecko	At Risk -Declining	6.8 Km	Scrubland, forest
Naultinus elegans	elegant gecko	At Risk -Declining	9.0 Km	Scrubland, forest
Dactylocnemis pacificus	Pacific gecko	At Risk - Relict	7.9 Km	Scrubland, forest

6.0 Conclusion

The watercourses and flow paths within the site were classified as ephemeral and this is due to the stream bed being above the water table at all times and they appear to only receive surface flows. It is also noteworthy that the artificial ponds that were previously noted have not persisted, while kikuyu and gorse has overtaken the site in the absence of grazing.

Two 'natural wetland' features were identified on the property using protocols set out in the NPS-FM, along with patches of standing water in the vicinity of the ephemeral stream channel's lower reaches. However, the status of these features should be further investigated, as Feature 1 may be induced through drainage modification associated with existing earthworks, while Feature 2 appears to have established from seed that was transferred in a patch of relocated soil, and may not be a functional wetland despite the occurrence of wet-tolerant species.

Vegetation within the subject site offers prospective habitat for native fauna, lizards in particular. Management to minimise effects on native fauna will be required as part of a consent application to develop the site.

7.0 References

Bioresearches (2016). Watercourse classification and freshwater ecological assessment 2182 East Coast Road & Lot 1 DP 200971, Silverdale. p 15

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