

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE
WAIMAKARIRI DISTRICT COUNCIL**

IN THE MATTER OF

The Resource Management Act 1991 (**RMA**
or **the Act**)

AND

IN THE MATTER OF

Hearing of Submissions and Further
Submissions on the Proposed Waimakariri
District Plan (**PWDP** or **the Proposed Plan**)

AND

IN THE MATTER OF

Hearing of Submissions and Further
Submissions on Variations 1 and 2 to the
Proposed Waimakariri District Plan

AND

IN THE MATTER OF

Submissions and Further Submissions on the
Proposed Waimakariri District Plan by
Momentum Land Limited

**EVIDENCE OF ANNABELLE JULIA COATES
ON BEHALF OF MOMENTUM LAND LIMITED REGARDING STREAM 12
REZONING OF LAND**

DATED: 5 March 2024

Presented for filing by:
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INTRODUCTION

- 1 My name is Annabelle Julia Coates.
- 2 I am employed as a senior ecologist by Viridis Limited, an environmental consultancy which specialises in environmental science and ecology, specifically investigations, monitoring, valuation and impact assessment.
- 3 I hold the following qualifications:
 - 3.1 Bachelor of Science in Biology (endorsed in Environmental Science) from the University of Canterbury, 2010.
 - 3.2 Master of Science in Environmental Science from the University of Canterbury, 2013.
- 4 I have ten years' experience as a professional ecologist and during that time have undertaken numerous ecological surveys and monitoring programmes, assessments of ecological values and assessments of effects of proposed works on ecological values for freshwater, estuarine, marine and terrestrial environments.
- 5 I have completed assessments of ecological values, assessments of effects on those values and ecological monitoring throughout New Zealand for clients including land developers, farmers, councils, mining companies and engineering and planning consultants. I have completed various assessments of wet areas or putative wetlands to determine their status as a wetland or otherwise in various locations around New Zealand. I am familiar with the current National Policy Statement for Freshwater Management (2020) (NPS FM 2020) and the protocols incorporated by reference within it for identifying natural inland wetlands. In my previous role I undertook expert reviews of resource consent applications and technical reports on behalf of Environment Canterbury and Otago Regional Council. I have provided written evidence and attended various council hearings.
- 6 I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material

facts known to me that might alter or detract from the opinions expressed in my evidence.

SCOPE OF EVIDENCE

- 7 In my evidence I address the following issues:
- 7.1 Classification of ecological features within the North and South Blocks of the area collectively known as the 'The Site' (Figure 1).
 - 7.2 The valuation of existing ecological features.
 - 7.3 Expected effects on those ecological features resulting from the change in land use from rural to residential.
 - 7.4 Recommended mitigation and enhancement to address any detrimental effects.

SUMMARY OF EVIDENCE

- 8 This evidence is in respect of a submission by Momentum Land Limited ("Momentum") on the Waimakariri District Council notified proposed District Plan and a submission by Momentum on Variation 1 to the Proposed Plan which allows for housing intensification in accordance with the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. Momentum seeks to rezone the two blocks of land including Lot 2 DP 83191 and Lot 2 DP 4532 from Rural Lifestyle to Medium Density Residential.
- 9 My evidence is in support of the rezone proposed by Momentum and covers aspects relating to terrestrial and freshwater ecological values within the site.
- 10 The site is currently zoned rural and landuse and ecological values are reflective of this. Terrestrial vegetation and habitat is heavily influenced by agricultural activities with managed pasture the dominant vegetation type. Habitat for terrestrial fauna is therefore limited with low value bird and lizard habitat present.
- 11 Freshwater values are limited to constructed drains (both farm and roadside), with the highly modified, but natural McIntosh Drain on the eastern boundary (but outside of the site). Old, reclaimed channels are visible in aerial images. Instream values are limited due to the artificial nature of the channels, rural land use and lack of riparian vegetation.

- 12 Changing the zoning from rural to residential will result in different pressures on ecological values. It is expected there will be an increase in impervious surfaces potentially altering waterways that receive stormwater, changes in pest animal abundance, the loss of farm drain habitat and a change in vegetation to areas dominated by urban gardens and greenspace.
- 13 It is expected any adverse effects on ecological values from urban development can be adequately mitigated at resource consent stage. Stormwater management, and development of greenspace to the east of the North Block has the potential to significantly increase ecological values.
- 14 A six hectare area directly to the east of the North Block, though not within the proposed rezoning boundaries, is intended to be developed for stormwater management, and will include the realignment of McIntosh Drain. This will result in significant increases in ecological values, including through riparian planting and provision of fauna habitat, and stormwater management.
- 15 Overall, the change in zoning is not expected to result in detrimental effects on ecological values, and is likely to result in increases in ecological values, particularly through increased botanical values, increased indigenous vegetation cover, and increased habitat for native fauna, particularly birds.

CONTEXT

- 16 My evidence is in respect of a submission by Momentum Land Limited ("Momentum") on the Waimakariri District Council notified proposed Waimakariri District Plan (PDP) and a submission by Momentum on Variation 1 to the Proposed Plan (Variation 1) which allows for housing intensification in accordance with the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. Momentum seeks to rezone the two blocks of land including Lot 2 DP 83191 and Lot 2 DP 4532 from Rural Lifestyle to Medium Density Residential.
- 17 MLL's submissions seeks to rezone two blocks of land from Rural Lifestyle to Medium Density Residential. The two blocks comprise of the following land parcels:
- (a) "South Block": Lot 2 DP 83191, being 6.04 hectares of land at 310 Beach Road.

(b) "North Block": Lot 2 DP 4532, Lot 1 DP 5010 and Lot 5 DP 313322, totalling 28.5 hectares of land at 177 Ferry Road

- 18 In my evidence I refer to the North and South Blocks collectively as the "Site" or the "Moore Block". Where a distinction between the blocks is necessary, I use the naming convention of "North" and "South".
- 19 Additionally, an area to the east of the North Block is included in my assessment. This area is beyond the boundaries of the rezoning, however its development is linked through proposed stormwater management to service the residential area. This area is referred to as the "Stormwater Management Area" or SMA.
- 20 I was engaged by Momentum Land Limited to provide ecological advice and valuation to feed into master-planning, design, and rezoning proposals associated with developing the North Block and the South Block.
- 21 I completed two site visits to the Site, including the South Block on 28 September 2022, and of the North Block on 27 March, 2023. The September site visit occurred during employment in my previous job, at Babbage (Bioresearches).
- 22 The two blocks, and the SMA are identified on Figure 1. The North Block is outlined in yellow. the South Block is outlined in red, and the SMA in grey.



Figure 1: Location of the North Block, the South Block, and the SMA, collectively referred to as the Site or the Moore Block

- 23 My evidence is split into three parts. **Part 1** provides an overview of my involvement in the project. It provides a description of the North and South Blocks, as well as the SMA, an assessment of ecological values using standard ecological methodologies, which are detailed below.

24 **Part 2** assesses the proposed rezoning of the Site against effects on ecological values. It also summarises and responds to issues raised by submitters that are specific to ecology.

25 **Part 3** provides an assessment of the proposed rezoning against relevant statutory documents, from an ecological perspective.

Methodology

26 Site assessments were undertaken of the South Block on 28 September 2022, and of the North Block on 27 March, 2023. During these site assessments, (waterways and overland flow paths were assessed), the two blocks were assessed for the presence of natural wetlands, and vegetation and potential fauna habitats were assessed.

Terrestrial ecology

27 A site walkover was undertaken to assess the vegetation and terrestrial fauna values within the blocks. Botanic values recorded included native and exotic vascular vegetation and notes were made on the quality and extent of vegetation present on site.

28 Fauna habitats assessed considered indigenous lizards and birds and an opportunistic bird survey took note of birds seen or heard for the duration of the visits. Opportunistic observations were supplemented with reviews of existing published and unpublished data and online databases.

Freshwater Ecology

29 Watercourses were classified under the Canterbury Land and Water Regional Plan (LWRP) to determine, in accordance with the definitions in these plans, the status of the watercourse.

30 Potential wetlands were classified in accordance with the RMA and the NPS – Freshwater Management and the Ministry for the Environment Wetland Delineation Protocols.

31 During the site assessments, the presence and extent of water was noted, reference photos were taken and freshwater habitats were marked using a cell phone based GIS application. The quality of the aquatic habitat was assessed, noting ecological aspects such as channel modification, hydrological heterogeneity, riparian vegetation extent, substrate types and any fish or macroinvertebrate habitat observed. Riparian and catchment information was

also reviewed. Instream habitat observations were supplemented with reviews of existing published and unpublished data and online databases.

Ecological Impact Assessment Methodology

32 Guidelines for undertaking Ecological Impact Assessments have been published by the Environment Institute of Australia and New Zealand (EIANZ; Roper-Lindsay et al. 2018). Chapter 5 of the Guidelines provides criteria for assigning value to habitat for assessment purposes. Criteria for describing the magnitude of adverse effects are given in Chapter 6 of the EIANZ Guidelines. Ecological values have been assigned based on Table 1 of **Appendix 1**, adapted from Tables 5 and 6 of EIANZ 2018.

PART 1 - THE RECEIVING ENVIRONMENT

Site Description

33 The blocks are located within the Lower Plains Ecological District. The district is characterised by alluvial floodplains that have been highly modified for farming, with only small areas of remnant indigenous vegetation, which are mainly confined to reserves. Historically (pre-human), the blocks themselves were likely dominated by podocarp-hardwood forest. Earliest historical aerials available indicate the Site and the surrounding landscape has been devoid of native vegetation, and managed as agricultural land for at least the last 80 years (Figure 2).



Figure 2: Site as it was in 1941.

South Block

- 34 The South Block occupies an approximately 6 ha site on Beach Road.
- 35 Currently, the South Block consists of a residential lot, occupied by a permanent dwelling, a relocatable dwelling, and associated storage and outbuildings, with the rest of the site dominated by grazed paddocks and shelterbelts. The South Block is entirely surrounded by various types of

residential development and of varying ages. The western and southern boundaries are adjacent to residential properties, while the northern boundary adjoins Kaiapoi North School and the eastern boundary is adjacent to a recently developed stormwater facility.

36 Along the southern boundary, between the South Block and Beach Road, is an open stormwater/drainage channel. It flows eastwards before joining McIntosh Drain, which eventually discharges to the Kaiapoi River. Along the eastern boundary is a private open drainage channel. The channel flows southwards before joining the channel along Beach Road.

37 There are no significant natural areas (SNAs) listed in Schedule ECO-SCHED1 of the proposed Waimakairi District Plan within the South Block. The closest SNA (SNA005) is located over 2.5km south of the site.

North Block

38 The North Block is an approximately 29 ha block of land directly north of the existing Beechgrove subdivision.

39 The North Block currently consists entirely of grazing land, with associated fencing and a shed. A paper road bisects the North Block to the north of a constructed stormwater facility. The western boundary is bounded by the Moorcroft development, the southern boundary borders the existing Beechgrove subdivision, the eastern boundary is adjacent to McIntosh Drain, while the northern boundary consists of rural grazing land.

40 There are no significant natural areas (SNAs) listed in Schedule ECO-SCHED1 of the proposed Waimakairi District Plan within the North Block. The closest site is SNA005, on the banks of the Waimakariri River, as mentioned in 37.

Stormwater Management Area

41 The SMA is an approximately six hectare block of land directly adjacent to the North Block.

42 The SMA is currently entirely grazing land, with associated fencing and portions of farm drains. It is entirely surrounded by grazing land.

43 There are no significant natural areas (SNAs) listed in Schedule ECO-SCHED1 of the proposed Waimakairi District Plan within the North Block. The closest site is SNA005, on the banks of the Waimakariri River, as mentioned in 37.

Ecological Values

South Block

Vegetation

- 44 The ecological value of the vegetation within the South Block was considered to be negligible.
- 45 The South Block predominately consisted of grazed pasture with common associated pasture weeds (sheep, cattle and horses were present at the time of the site visit) (Photo 1, Photo 2). In addition, there were various rows of shelter providing exotic trees, consisting of gums (*Eucalyptus spp.*), willows (*Salix spp.*) and poplars (*Populus spp.*) (Photo 3, Photo 4). A small area of flax (*Phormium tenax*) and cabbage trees (*Cordyline australis*) were present directly behind the WDC pump station in the south western corner of the South Block. The flaxes showed evidence of grazing (Photo 5). Review of aerial images suggests these were planted in the late 2010's, likely at the same time the area around the pump station was planted. Common garden plant species were present around the house block.
- 46 The botanical value of the vegetation within the South Block was very low, being heavily dominated by exotics and pasture. There was no native vegetation, with the exception of the planted area behind the pump station, and a small number of cabbage trees amongst willows. Overall, the vegetation within the South Block provided low-quality fauna habitat due to the lack of complexity, high edge effects and low terrestrial connectivity.



Photo 1: The South Block was dominated by actively managed pasture



Photo 2: Sheep, cattle and horses were grazing on the South Block



Photo 3: Exotic shelterbelts within the South Block



Photo 4: Shelterbelts and the house block vegetation



Photo 5: Small area of planted flax and cabbage trees. Flax had been browsed.

Fauna Habitat

- 47 The ecological values of the South Block as they pertain to fauna habitat are considered to be low.
- 48 No significant indigenous lizard habitat was identified on the South Block, with the current habitat unlikely to provide habitat to native skinks. There is potential for lizards to be present in the debris around the dwellings, however this is likely to be dependent on a lack of disturbance and connectivity to higher quality habitat. Additionally, both domestic cats and dogs were present around the dwelling. Arboreal geckos are not likely to be present due to the lack of suitable vegetation and lack of connection to areas of suitable vegetation. There are no significant areas of indigenous vegetation in the vicinity of the South Block.

- 49 Only limited avifauna, exotic or native, was observed on the South Block. Species observed including pūkeko (*Porphyrio melanotus*; Not Threatened¹), ducks (*Anas platyrhynchos*; Introduced and Naturalised), blackbirds (*Turdus merula*; Not Threatened; Introduced and Naturalised), and sparrows (*Passer domesticus*; Introduced and Naturalised). Common native and exotic species would be expected to be present. Habitat available for native birds to utilise for foraging was limited. It is likely pūkeko are the only species present on a regular basis, though common native species such as fantails will likely visit the South Block. Habitat quality was considered low due to the low diversity and abundance of vegetation. The shelterbelt trees will provide roosting and nesting habitat for common native and exotic bird species.

Freshwater Ecology

- 50 Based on review of historic aerial images, no natural freshwater features are considered to be present on site (Figure 3 **Error! Reference source not found.**). The features currently present were all considered to be artificial channels, constructed for drainage purposes.

¹ Robertson, H. A., Baird, K., Dowding, J. W., Elliott, G. P., Hitchmough, R. A., Miskelly, C. M., McArthur, N., O'Donnell, C. F. J., Sagar, P. M., Scofield, P. & Taylor, G. A. (2017). Conservation status of New Zealand birds, 2016. New Zealand Threat Classification Series 19. Department of Conservation, Wellington.

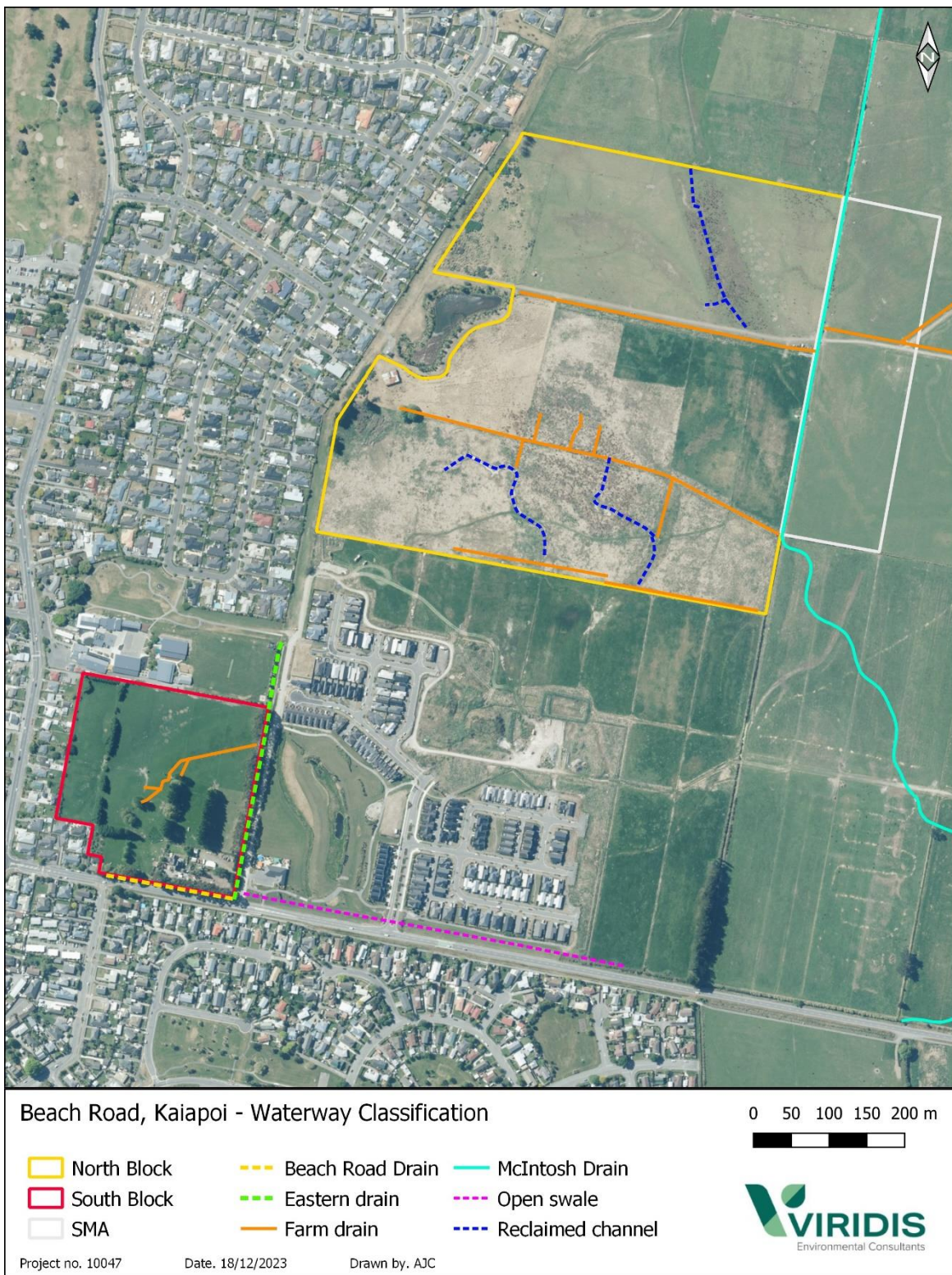


Figure 3. Freshwater features within the Site

- 51 Observations regarding the South Block Farm Drain can be summarised as follows:
- 51.1 The ecological values of the farm drain were considered to be negligible.
 - 51.2 A farm drain originated from approximately the middle of the South Block and flowed in a generally north east direction before flowing into the eastern drain. Review of aerial images show this drain was constructed sometime between February 2018 and March 2019. Since then, it has been maintained, as evidenced by the spoil deposited on the banks. It is therefore considered to meet the definition of a 'drain' as per section 2.9 of the LWRP. The hydrology regime of the drain appears to be ephemeral in nature and is dry for much of the year.
 - 51.3 At the time of the site visit, the drain contained non-flowing, shallow (~0.1m deep) water. The substrate was entirely silt, and no macrophytes were present (Photo 6). While it appears to discharge to the eastern drain, flow/water levels were not sufficient to provide a direct connection (Photo 7). Riparian vegetation was limited to pasture species providing no effective shading. The drain provides no habitat for fish, and the current water level means fish passage into the drain is not possible.



Photo 6: Constructed farm drain



Photo 7: The point where the farm drain would discharge to the eastern boundary drain if flow was high enough

- 52 Observations regarding the South Block Eastern Drain can be summarised as follows:
- 52.1 The ecological values of the eastern drain were considered to be low.
- 52.2 The eastern drain flows down the eastern side of the South Block, just outside of its boundaries. It originates from just north of the South Block, near Kaiapoi North School, and flows in a southerly direction before discharging to the Beach Road Drain. Review of historic aerial images also suggest it has been dug for drainage purposes, therefore meeting the definition of a drain in the LWRP. It has been subject to significant changes over the last approximately 10 years, including the development of the subdivisions to the east and north of the South Block. A portion of the flow was directed into the constructed stormwater facility to the east of the South Block, when it was developed around 2010.
- 52.3 The drain contained non-flowing, relatively shallow (~0.2m) water (Photo 8). Substrates were soft and probing with a pole suggested they were deep. Duckweed (*Lemna disperma*), was present along the reach, but was at higher densities in the northern portion of the drain. Access into the South Block crossed the eastern drain. It is assumed this crossing consisted of a culvert, however water levels and/or sediment prevented this being confirmed.

Immediately upstream of the crossing iron-oxide bacteria was present. Riparian vegetation was limited to a line of gum trees on the true right, with semi-maintained grass on the true left. It is possible the drain contains shortfin (*Anguilla australis*, Not Threatened²) eels as habitat present was suitable for their presence.

- 53 Observations regarding the Beach Road Drain can be summarised as follows:
- 53.1 The ecological value of Beach Road was considered to be low.
- 53.2 Beach Road Drain flows along the Beach Road boundary of the South Block. It flows out of a culvert opposite where Meadow Street terminated at Beach Road, and continues to flow eastwards before flowing into a scruffy dome near the south east corner of the South Block (Photo 9). East of the South Block, the drain has been reconfigured into a stormwater swale complex. There is no apparent permanent surface water connection between the drain and the receiving environment; the Macintosh Drain. It is likely surface water connections are only available temporarily following significant rainfall.
- 53.3 The channel contained relatively shallow (~0.2m) water and no obvious flow was present. Substrates were dominated by mud and leaf litter. Duckweed, was present along the reach, but no other macrophytes were present. Iron-oxide bacteria was also present, concentrated around the area where it flows out of the culvert. There was a sheen on the water indicating either the presence of hydrocarbons or a naturally occurring organic sheen associated with decomposing organic matter. Riparian vegetation was limited to semi-maintained (but rank at the time of the site visit) grass and weeds on the true right bank, with shelter belt exotic trees with some pampas (*Cortaderia selloana*) and flax on the true left.
- 53.4 There are no records in the New Zealand Freshwater Fish Database for the waterway, or for McIntosh Drain or any waterways within

² Dunn, N. R., Allibone, R. M., Closs, G. P., Crow, S. K., David, B. O., Goodman, J. M., Griffiths, M., Jack, D. C., Ling, N., Waters, J. M., & Rolfe, J. R. (2018). Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Department of Conservation, Wellington.

the catchment. It is considered likely that shortfin eel are present in the Beach Road Drain, however the degraded nature of the South Block, lack of connection to other surface water and likely compromised water quality suggest the presence of other fish species is unlikely.



Photo 8: Eastern boundary drain looking downstream to Beach Road



Photo 9: Beach Road drain looking upstream to the culvert

- 54 Wetlands within the South Block can be summarised based as follows:
- 54.1 There are no areas of wetland as per the ECan Wetland GIS layer within the South Block. The closest identified ECan wetland area is located approximately 330 m to the north east.
- 54.2 Directly to the east of the South Block is a constructed stormwater facility, but as it has been constructed, it does not meet the definition of a natural wetland as per the NPS – FM.
- 54.3 No natural wetlands as per the RMA and NPS-FM were identified. Small areas of mixed pasture and hydrophytic vegetation were present in the eastern part of the South Block, however all areas contained greater than 50% pasture, and therefore met pasture exclusion methodology criteria ³ and as such were excluded from the definition of a natural inland wetland.

³ Ministry for the Environment. 2022. Pasture exclusion assessment methodology. Wellington: Ministry for the Environment.

North Block

Vegetation

- 55 The ecological value of the vegetation within the North Block was considered to be negligible.
- 56 The North Block was almost exclusively managed pasture and has been used for both grazing of cattle and hay/baleage making over the past several years (Photo 10). At the time of the North Block visit there was no stock on the property and the paddocks has been recently cut with feed removed for use elsewhere. An area in the middle of the North Block was in the process of being re-seeded with new grass just starting to emerge from the soil (Photo 11).
- 57 Two areas of scrubby vegetation were present. One in the north west corner and the other on the western boundary to the south of the shed/stormwater facility. Both areas were located on uneven ground, with mounds approximately two metres high present in the north west area. The mounds in both areas appeared to be sand. The north west area contained predominantly rank grass with some sedges (Photo 12). The area south of the shed was more diverse but entirely dominated by exotic weedy species (Photo 13). Species present included tree lupins (*Lupinus arboreus*), blackberry (*Rubus fruticosus*), dock (*Rumex* spp.), black nightshade (*Solanum nigrum*), cats ear (*Hypochaeris radicata*), thistles (*Cirsium* spp.), broom (*Cytisus scoparius*) and kangaroo apple (*Solanum laciniatum*). Both areas were bordered at least partially by large, mature macrocarpa (*Cupressus macrocarpa*).



Photo 10: Pasture dominated the north block



Photo 11: Area in the middle of the North Block in the process of being sown



Photo 12: Area of scrub near north western corner



Photo 13: Area of exotic scrub on western boundary

Fauna Habitat

- 58 The ecological values of the North Block for fauna habitat was considered to be low.
- 59 No significant indigenous lizard habitat was identified in the bulk of the North Block. It is possible native skinks will be present in the scrubby areas, and potentially along the banks of the drains where rank grass is present. Lizards were relocated from the lower part of McIntosh Drain as part of the realignment of the phase of Beechgrove currently under construction. Five southern grass skinks (*Oligosoma* aff. *polychroma* clade 4) were salvaged. No habitat for native geckos was present in the North Block.
- 60 Limited avifauna, exotic or native, were observed on North Block. One small flock (approx. 20 individuals) of exotic passerines was observed flying throughout the North Block. In addition, a number of paradise shelducks (*Tadorna variegata*; Not threatened) were present, however more were

observed in the paddocks on the other side of McIntosh Drain. It is also likely that pūkeko and Australasian harriers (*Circus approximans*, Not Threatened) utilise the North Block, as well as the wider area. The large macrocarpas provide limited roosting and nesting habitat for common native and exotic birds.

Freshwater Ecology

- 61 Observations regarding McIntosh Drain can be summarised as follows:
- 61.1 The ecological value of McIntosh Drain was considered to be high, due to the likely presence of At Risk fish species.
 - 61.2 McIntosh Drain forms the eastern boundary of the North Block (Figure 3). The drain has been present in the area since prior to 1900, however, it is considered to be a natural modified watercourse and evidence of old, abandoned channels is present on aerial images, including within the North Block itself.
 - 61.3 The drain was straight, and contained within steep, regular banks (Photo 14, Photo 15). Flow was generally slow, with some reaches containing no apparent flow. Water was discoloured, though clear. The substrate was dominated by soft, fine sediment and macrophytes including curly pondweed (*Potamogeton crispus*) and duckweed were abundant. Riparian vegetation was limited to rank grass and pasture weeds. The waterway itself was fenced from stock. One culvert was present within/adjacent to the North Block, on the paper road that bisects the North Block. All farm drains within the North Block ultimately flow into McIntosh Drain.
 - 61.4 Downstream of the North Blocks south eastern corner, McIntosh Drain has been recently realigned. The realignment has been part of the development of Beachgrove subdivision and has included realignment of approximately 850 m of the drain, riparian planting, instream habitat enhancement, and development of stormwater infrastructure to service Beachgrove.
 - 61.5 No specific fauna surveys were undertaken as part of this assessment, however, results from investigations undertaken as

part of the consenting process for the downstream realignment⁴ are relevant to the North Block. These revealed the macroinvertebrate community was dominated by pollutant tolerant species, with invertebrate metrics suggesting water and habitat quality was 'poor'. Fish surveys yielded only shortfin eels (Not Threatened⁵). However, recent fish relocation from this channel also caught inanga (*Galaxias maculatus*, At Risk – Declining) and giant bully (*Gobiomorphus gobioides*, At Risk – Naturally Uncommon).



Photo 14: McIntosh Drain looking upstream near the culvert crossing



Photo 15: McIntosh Drain looking downstream

62 Observations regarding the reclaimed channels can be summarised follows:

62.1 The ecological value of the reclaimed channels was considered to be negligible.

62.2 Within the southern and northern paddocks were reclaimed channels that followed the natural contours of the area (Photo 16, Photo 17, Figure 3). These channels appear to be the old channels that would have once formed the original alignment of McIntosh Drain. However, since McIntosh Drain was constructed, they have not contained flow (at least as long as historical aerial records are available for). Historical aerial images from 1941 suggest the

⁴ Tonkin and Taylor (2021). Beach Grove - McIntosh Drain Realignment - Ecological Impact Assessment. Job number 53246.9.v1. Prepared for Beach Road Estates Ltd.

⁵ Dunn, N. R., Allibone, R. M., Closs, G. P., Crow, S. K., David, B. O., Goodman, J. M., Griffiths, M., Jack, D. C., Ling, N., Waters, J. M., & Rolfe, J. R. (2018). Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Department of Conservation, Wellington.

presence of a channel, but not any water. It is therefore considered more appropriate to consider these areas as reclaimed channels that may contain ephemeral water.

- 62.3 Some reclaimed channels were being managed as farm drains and had been shaped to form swales. The managed sections also only contained ephemeral flow. The green line visible in the southern paddock in Figure 3 that tracks in an east-west direction, is a vehicle track, not a waterway/swale/channel. It was not present during the March 2023 site visit.



Photo 16: Reclaimed channel with a small amount of water



Photo 17: Reclaimed channel completely grassed

- 63 Observations regarding the farm drains within the North Block can be summarised as follows:
- 63.1 The ecological value of the permanent farm drains was considered to be low. The values of the ephemeral farm drains was considered to be negligible.
- 63.2 Several farm drains were present within and around the North Block (Figure 3). The farm drains were straight, relatively deep drains with a permanent water presence. The constructed, straight drains were considered to be mostly permanent, and are expected to contain water year round. A small number, mostly lateral drains, were considered to be ephemeral. These all drained directly from paddocks into a larger permanent drain. All farm drains showed evidence of ongoing maintenance, with spoil deposited on the banks in several locations.

- 63.3 The drains were considered to be artificial. They cannot be observed on the oldest available aerial images (1941) and they are located along the three paddock boundaries within the North Block. The drains are all artificially straight, deep enough to intercept the water table (based on observations), but the water present within them is not flowing, unlike McIntosh Drain where a permanent flow is present. The drains have no apparent water source such as springs. It is considered the water they contain is shallow groundwater and/or overland runoff if rain has occurred.
- 63.4 The permanent farm drains mainly contained water. There was no discernible flow. Water was reasonably clear, and the substrates could be characterised by soft sediment. There were some areas where the floating macrophyte duckweed was present, however, generally the drains were free from macrophyte growth (Photo 18, Photo 19). Occasional sedges and rushes were present in the shallower areas, and on some margins. Riparian vegetation consisted of short/managed/grazed grass where the drains were not fenced, and ungrazed/rank grass where fencing was present (Photo 20). The drains presented low quality fish and macroinvertebrate habitat. The macroinvertebrate community is likely to be dominated by pollution and fine sediment tolerant taxa such as snails and worms. It is considered likely the permanent drains contain shortfin eels. Shortfin eels are known to be present in relatively large numbers in McIntosh Drain, the receiving waterway for these drains.
- 63.5 All drains showed evidence of maintenance, with many having spoil dug from the drain on their banks (Photo 21).
- 63.6 In addition to the artificial drains, there were a small number of drains that appeared to follow natural stream alignments (e.g. the presence of meanders). The ephemeral, natural alignment drains did not contain any significant water. Some areas of ponding were present, considered to be left over from rain the week prior to the site visit (31mm of rain was recorded at the Christchurch Airport

weather station⁶). None of these drains presented any aquatic habitat.



Photo 18: Farm drain with duckweed growth



Photo 19: Farm drain



Photo 20: Small farm drain with abundant rank grass in riparian zone



Photo 21: Farm drain that had been recently cleaned

64 An overview of the potential wetlands within the site is as follows:

64.1 There were no wetlands, as per the definition of a natural inland wetland within the NPS – FM, present within the North Block. All areas within the North Block met pasture exclusion methodologies. Ryegrass was the dominant vegetation feature within the North Block, with the exception of the scrubby areas, as discussed in paragraphs 56 and 57.

64.2 The ECan GIS Wetland Layer identifies three wetlands within or adjacent to the North Block (Figure 4). None of these areas had

⁶ Records retrieved from <https://cliflo.niwa.co.nz/>, 19 April 2023.

been ground truthed prior to being inputted into the ECan database, rather they were identified via an aerial survey.

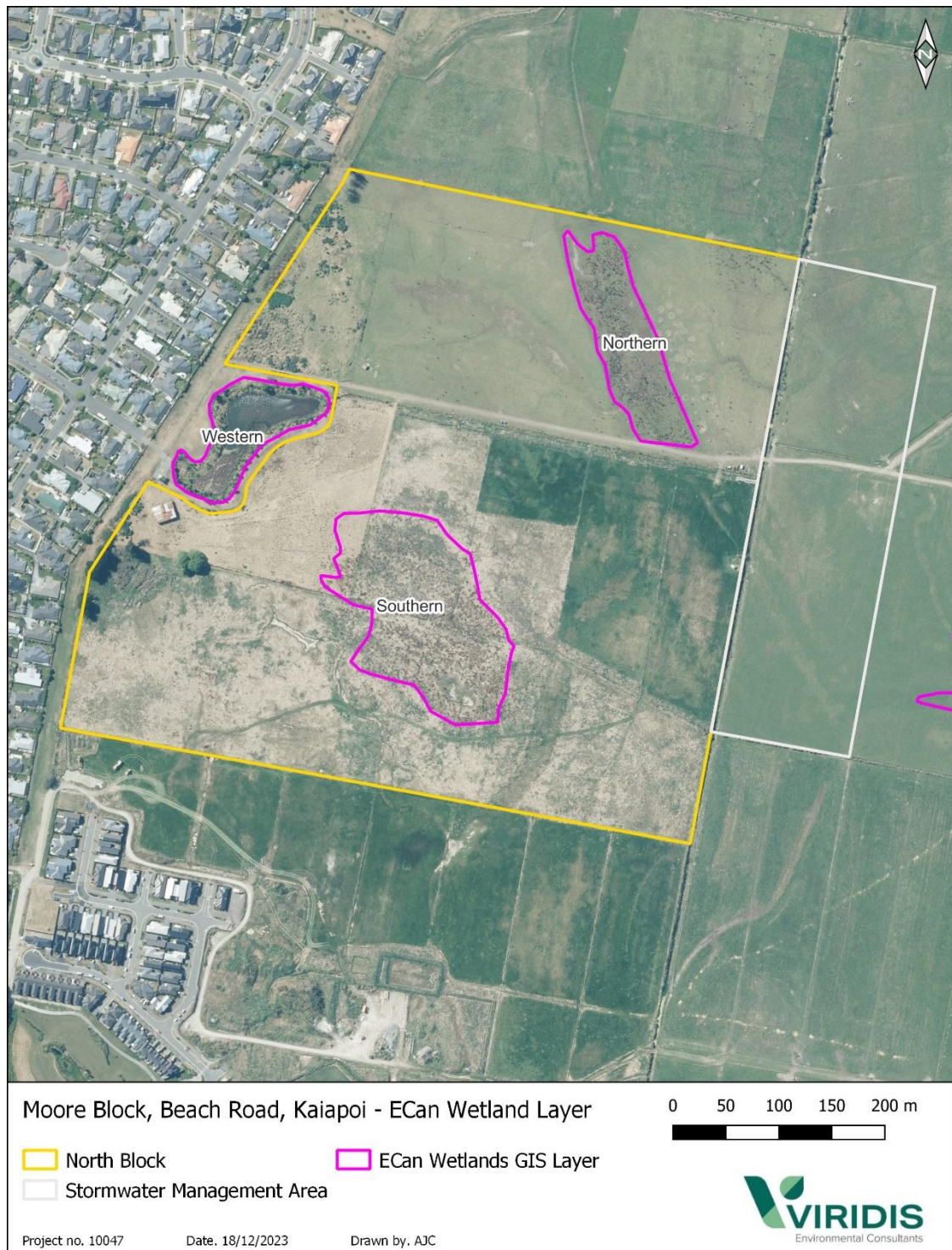


Figure 4: Areas identified in ECan's Wetland GIS layer

64.1 The southern area, located in the southern and middle paddocks, was dominated by managed pasture (ryegrass) and was present on either side of a permanently wet farm drain (Photo 22). The

Evidence of Anabelle Coates for Momentum dated 5 March 2024 (Ecology)

southern area met the pasture exclusion methodology due to the complete dominance of ryegrass.

64.2 Review of historical aerials of the northern area, suggest this area is part of a reclaimed channel, as water can be observed pooling in the area (as well as where the channel continues on neighbouring properties) following significant rainfall (e.g. the very wet 2022 winter). At the time of the North Block visit, a small amount of water was present in a defined low point (Photo 23). It is considered more appropriate that this channel is considered to be an ephemeral overland flow path within a reclaimed channel. The bare ground of the channel was bordered on either side by managed pasture which met the pasture exclusion methodology.

64.3 The western area is a constructed stormwater pond, and is located outside of the North Block boundaries (Photo 24, Photo 25). The NPS – FM expressly excludes constructed waterbodies from the definition of a natural inland wetland.

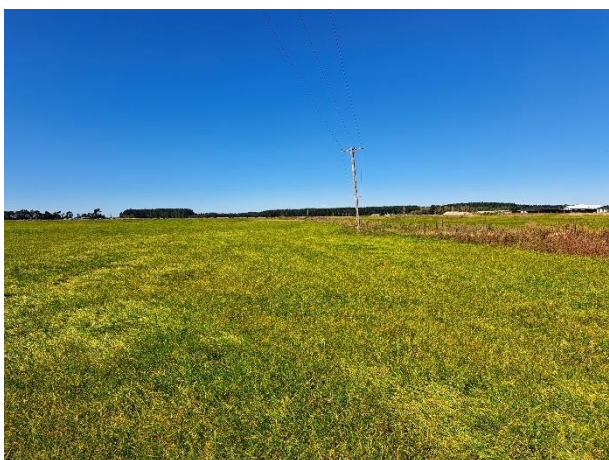


Photo 22: The southern area. The darker vegetation is rank vegetation either side of the farm drain.

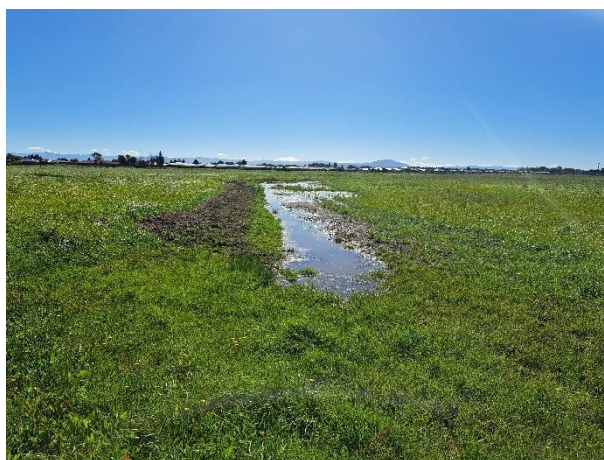


Photo 23: The northern area is an old reclaimed channel.



Photo 24: The western area is a constructed stormwater pond.



Photo 25: Planting associated with the constructed stormwater pond.

Stormwater Management Area (SMA)

- 65 Although not technically within the North Block boundaries, or area to be rezoned, the area to the east of the North Block is intended to form open space and contain future stormwater management devices that will enable the North Block to be developed. Site access constraints meant observations were made from within the North Block, looking across the SMA.
- 66 The SMA was entirely grassed and had cattle grazing on it at the time of the site visit. Occasional rushes were dotted within the paddocks, however the area was heavily dominated by pasture species. No other vegetation was present.
- 67 A number of paradise ducks were present within the area and appeared to be grazing.
- 68 The ecological value of the SMA was considered to be low, due to the dominance of pasture grasses, and limited fauna habitat.

Ecological Significance

- 69 **Appendix 2** provides an evaluation of the North and South Blocks assessed against the ecological significance criteria contained within the Canterbury Regional Policy Statement⁷. For a site to be considered ecologically significant it must meet at least one of the criteria. If one criteria is met, the site can be considered to be a Significant Natural Area.

⁷ Wildlands. 2013. Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury Region. Contract report no. 2289i, prepared for Canterbury Regional Council.

- 70 Neither Block meet any of the criteria, therefore they are not considered to be significant. McIntosh Drain is within the SMA, therefore the potential presence of At Risk fish species in the waterway does not trigger Rarity/Distinctiveness criteria for the North Block, however, it does trigger it for the SMA.
- 71 Future development is highly likely to include development of stormwater infrastructure in the SMA, which is also likely to include the realignment of the portion of McIntosh Drain that currently flows along the eastern boundary of the North Block. Potential effects of realigning McIntosh Drain to accommodate future stormwater management within the SMA are discussed below.

PART 2 - ASSESSMENT OF ECOLOGICAL EFFECTS

Changes anticipated following rezoning of the site

- 72 The rezoning proposal will result in the zoning of the land changing from the current rural zone to a residential zone. Associated with the change in land use it is expected that the following changes will occur:
- 72.1 Increase in impervious surfaces
 - 72.2 Potential increase in runoff from impervious surfaces
 - 72.3 Removal/alteration of farm drains
 - 72.4 Initial clearance of vegetation followed by establishment of gardens/landscaping
 - 72.5 Loss of habitat through vegetation clearance and displacement of fauna
 - 72.6 Altered disturbance of habitat and native fauna through development activities and ongoing use
 - 72.7 Provision of new habitat through gardens and greenspace
- 73 Potential effects relating to the realignment of McIntosh Drain are also considered. While these will not occur as a direct result of the rezoning proposal, development of stormwater assets will be necessary to accommodate residential development. These assets are currently planned for the SMA area. Potential effects include:
- 73.1 Effects on fish and macroinvertebrates from instream works

- 73.2 Loss of instream habitat
 - 73.3 Effects of sediment on the freshwater environment
 - 73.4 Positive effects from riparian planting and habitat enhancement
- 74 Specific effects relating to any future development of the Site will be addressed in future consenting processes, when there are development plans. Without plans, it is not possible to determine the magnitude (or scale) and overall level of effect can be determined. However, at the rezoning proposal stage, potential effects on ecological values can be discussed.

Increased impervious surfaces and associated effects including increased runoff

- 75 Moving from a rural environment where there are essential no impervious surfaces, to a residential environment, results in the proliferation of roads, paths and building roofs. If not properly managed, excess stormwater can damage receiving waterways through high velocities and increased scour. From an ecological perspective, this can result in decreased habitat values, sedimentation and loss of riparian vegetation.
- 76 Any residential development is likely to be undertaken in conjunction with stormwater management through measure such as detention basins and treatment wetlands. As such, it is expected any effects on ecological values as a result of increased impervious surfaces and associated runoff can be adequately managed and/or mitigated, and improved through increased treatment and management, and removal of stock and fertiliser applications.

Loss of Farm Drains

- 77 The existing permanent farm drains provide low quality aquatic habitat, likely only for common, tolerant taxa. It is expected these waterways will be reclaimed, or at least significantly altered if the blocks become residential which will result in the loss of habitat.
- 78 All permanent drains, including the Eastern Drain and Beech Road Drain on the South Block, and the permanent farm drains on the North Block provide low quality habitat. It is expected their loss will not result in a significant overall level of effect on ecological values providing any fish residing within the channels are rescued and relocated prior to the reclamation of the channels, or any instream works occurring.

- 79 The ephemeral drains on both blocks do not provide any significant freshwater habitat due to the lack of permanent or intermittent flow. Their loss will not affect ecological values.
- 80 McIntosh Drain sits just outside the area proposed to be rezoned. However, as it will form the boundary between rural and residential land, it is expected it will receive increased stormwater inputs and the riparian zone is likely to be altered. The drain may benefit from the land use change as stormwater is likely to be treated, and existing waterways are often enhanced through riparian planting. Any instream works or realignment will occur after future resource consenting and with consents only granted if any detrimental effects are managed/mitigated. Effects of a potential realignment are discussed in paragraphs 90 to 102. The reach of McIntosh Drain downstream of the North Block has recently been realigned and is now associated with new, native riparian planting, floodplain planting and added fish habitat. It is expected the land use change will have a positive outcome for the ecological values of McIntosh Drain, similar to what has occurred downstream.

Vegetation clearance and movement to gardens and greenspace from farmland

- 81 Currently, there is very little vegetation present in either block. Botanical and ecological values for both were considered to be negligible. The largely exotic trees that form the shelterbelts in the Southern Block, and the small number of macrocarpa in the Northern Block are expected to be cleared. This will result in the loss of nesting and roosting habitat for the common native and exotic birds present in the area. However, the loss is expected to be temporary, and will be mitigated once residential gardens, and landscaped public greenspace are developed. It is expected any birds that usually utilise the trees within the blocks will use the significant alternative habitat within Kaiapoi and the surrounding rural area until residential vegetation has established.
- 82 Public green spaces are likely to have a higher proportion of native species compared to what is currently present in either block. Private residential gardens are likely to have a significantly higher diversity of vegetation, though it is accepted residential development can often be associated with the invasion of weedy species into adjacent areas.

83 Overall, the loss of vegetation associated with the change in land use is expected to be temporary, and ultimately positive, once development has been completed and vegetation established.

Disturbance of habitat and fauna through development activities and ongoing use

84 As discussed in 81, it is expected birds will move from the Site during construction activities, and recolonise once construction has been completed and planted vegetation has begun to establish. However, change from a rural to an urban setting can also be associated with changes in pest animals.

85 The rezoning of the Site from rural to residential is expected to lead to an increase in human population density within the area. Increases in human population density can result in decreases in possum and rodent numbers, but an increase in cats⁸, which in turn, numbers of mustelids can decrease as a result of predation by cats. Hedgehogs can increase in abundance due to anthropogenically supplied food and shelter.

86 Due to the adjacent existing residential areas (e.g. Moorcroft, Beechgrove) it is expected cats are already present, at least in low-moderate numbers. An increase is expected once residential development has occurred. There is limited possum habitat present on the North Block, while the South Block provides a moderate amount in the mature trees within the Site. Mustelids are expected to be present though no evidence of any were observed during the site visits. Rabbits and hares were observed on the North Block during the site visit.

87 Overall, the change in land use from rural to residential is expected to result in an increase in cats and hedgehogs, a decrease in rabbits and hares, and no significant changes in possum and mustelid numbers, due to the likely very low abundance already. Rat numbers are generally expected to decrease, however factors such as rubbish dumping and cleanliness in urban areas can affect their numbers. Predation on indigenous fauna is expected to not change significantly, due to the very low abundance of native fauna on the Site.

⁸ Miller, K. F. (2020). 'Bring me a shrubbery': Assessing the habitat preference of mammalian predators in the urban green spaces of New Zealand cities (Masters dissertation, University of Otago).

- 88 Overall, the change in land use from rural to residential is not expected to have significant effects on ecological values that cannot be appropriately mitigated through design of future development. Any future work will likely be subject to resource consenting that will identify appropriate mitigation and areas for enhancement. It is expected that if development occurs according to industry best practice, there will be an increase in ecological values in many areas of the Site, particularly within areas of green space.

Positive effects

- 89 The positive effects on ecological values associated with the proposed rezoning include increased biodiversity and botanical values, increased presence of native flora, and increased habitat values for native fauna, particularly for birds. Water quality improvements are expected in McIntosh Drain through the provision of stormwater management and potential riparian planting. The potential realignment of McIntosh Drain will also result in positive outcomes, particularly around provision of riparian planting, providing increased shade, reduced water temperature, organic matter input, and filtration of overland flow.
- 90 Effects of the potential realignment of McIntosh Drain are discussed below. While not a direct effect of the proposed rezoning, realignment will likely be necessary in order to establish stormwater assets for the rezoned residential land. Effects of a potential realignment, including specific mitigation, will be assessed in detail at resource consent phase.

Effects on fish and macroinvertebrates from instream works

- 91 Realigning McIntosh Drain will require a new channel to be constructed, and the old (current) channel to be infilled. There is the potential for mortality of fish and macroinvertebrates if still present in the old channel when it is filled.
- 92 Macroinvertebrates generally are capable of rapidly colonising habitat, providing a source population is present. Species present in the Drain are expected to be common, tolerant species. It is expected the new channel will be rapidly colonised once water is present in the channel, with populations sourced from the up and downstream portions of McIntosh Drain, and potentially the Farm Drains if they are still present.
- 93 Effects on fish can be appropriately mitigated providing any fish residing within the channel are rescued and relocated prior to the reclamation of the

old channel, or any instream works occurring. This method has been effectively used during the realignment of McIntosh Drain downstream of the North Block. Several hundred fish, including long and shortfin eels, common bully, giant bully, and inanga, were captured within the drain and salvaged from excavated mud, before being released to the new section of McIntosh Drain.

Loss of instream habitat

- 94 Creating a new channel and closing an existing channel does create risks as it can be difficult to create a 'like for like' channel from scratch. Loss of instream habitat can have detrimental effects on habitat value, including habitat for fauna.
- 95 The new channel can be constructed to replicate the existing channel, plus have habitat enhancement features such as rock and log eel habitat, and variable depth and bank width. Variable flow regimes are unlikely to be implemented due to the very flat grade of the waterway (i.e. there is little fall between the up and downstream extents).
- 96 Detailed design at resource consent phase will confirm habitat enhancement options, as well as the length. Generally realignments do not result in a loss of lineal length, however if this does occur, effects and mitigation will be provided at consent stage. In this case, it is likely there will be an increase in lineal length as meanders can be added and the new channel will move away from the current straight alignment.

Effects of sediment on the freshwater environment

- 97 Any works within or adjacent to aquatic habitats have the potential to release excess fine sediment to the freshwater environment.
- 98 Excess fine sediment can reduce light penetration, smother food and refuges, and clog the gills of fish and macroinvertebrates.
- 99 Detrimental effects of fine sediment in waterways can be mitigated through the preparation and implementation of an erosion and sediment control plan prepared according to current industry best practice.

Positive effects from riparian planting and habitat enhancement

- 100 The realignment will also have significant positive effects on both instream and riparian habitat.

- 101 The realignment through proposed open/green space allows for extensive planting in the riparian zone of the new channel. Currently, the riparian zone of McIntosh Drain is limited to grazed pasture and weeds. Planting will provide a diverse community of native species which will provide ecosystem services such as filtration of overland flow, shading for the waterway (reducing instream temperature) and provision of habitat for native fauna. Increased shade and reduced temperature reduce the incidence of algae, provide more stable oxygen levels and reduce stress on instream fauna. Vegetation also provides organic matter inputs, providing food resources for macroinvertebrates.
- 102 Overall, it is expected the potential realignment of McIntosh Drain will result in increased habitat values for the waterway.

PART 3 - STATUTORY PLANNING ASSESSMENT

- 103 The following paragraphs address relevant policy statements, Acts and plans and includes discussion about how they provide for the change in landuse of the site, from an ecological perspective.

National Policy Statement for Freshwater Management

- 104 The NPS-FM provides national direction for decisions regarding water quality and quantity, and the integrated management of land, freshwater, and coastal environments under the RMA. The NPS-FM contains national objectives for protecting ecosystems, indigenous species and the values of outstanding water bodies and wetlands.
- 105 Changing from rural to urban landuse allows for the development of stormwater treatment and attenuation infrastructure that will ultimately improve freshwater values of receiving environments. Current development plans include the construction of two treatment/attenuation basins in the SMA to the east of the site. Stormwater will be treated prior to entering surface waterways .

National Environmental Standards for Freshwater

- 106 The NES-F sets requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems. The standards are intended to protect wetlands, protect streams from infilling and reclamation, maintain fish passage, and manage various effects stemming from agricultural activities.

- 107 Future resource consents required for the development of the site will require compliance with relevant NES-F regulations in relation to any natural waterway reclamation, including ensuring fish passage is maintained. No natural inland wetlands have been identified in either the North or South Blocks therefore protection of wetlands is not required.

National Policy Statement for Indigenous Biodiversity

- 108 The National Policy Statement for Indigenous Biodiversity (NPS-IB) sets out objectives, policies and implementation requirements to manage natural and physical resources to maintain indigenous biodiversity under the RMA. It outlines a system for the management of biodiversity outside of public conservation land.
- 109 It provides criteria for identifying significant natural areas as well as measures to protect these areas from inappropriate development.
- 110 There is no significant indigenous biodiversity within the site and no areas that meet the definition of a Significant Natural Area as per the NPS-IB Appendix 1 within the site. The presence of At Risk – Declining fish species in McIntosh Drain mean the SMA does meet significance criteria as McIntosh Drain is located within this area. Any effects on ecological values associated with developing the SMA will be assessed through resource consenting stages in the future. The effects management hierarchy will be applied to manage residual ecological effects. The proposed rezoning will provide opportunities to increase indigenous cover through planting and enhancements of riparian areas and greenspace, such as future stormwater management areas.

Wildlife Act (1953)

- 111 The Wildlife Act (1953) provides statutory protection for all native wildlife (lizard, frog, bat and bird species), excluding those species listed in Schedules 1–5. This includes several invertebrates (terrestrial and freshwater).
- 112 Changing the landuse from rural to urban may require salvage and relocation of wildlife not considered to be highly mobile, such as lizards. Handling and relocation of wildlife requires a permit under section 53 of the Act. Accidental killing of wildlife is also a risk associated with greenfield developments. Permits can be issued under section 54 of the Act to account for any wildlife not able to be relocated. Generally significant mitigation in the form of offsetting or compensation is required in this case. The proposed rezoning

change is not expected to require any wildlife to be killed. Lizards can be rescued and relocated, however lizard habitat in both blocks is minimal and therefore no significant numbers are expected. Birds are highly mobile and expected to move away from site, providing they are not actively nesting.

Canterbury Regional Policy Statement

- 113 The Canterbury Regional Policy Statement provides an overview of the resource management issues in the Canterbury region, and the objectives, policies and methods to achieve integrated management of natural and physical resources
- 114 Chapter 5 addresses landuse and infrastructure, including changes to landuses. From an ecological perspective, developing an urban subdivision on currently rural land is consistent with the Chapter 5 objectives. There are limited ecological values within the site to protect. Changes to the network of natural and artificial waterways will be addressed during future consenting phases.
- 115 Chapter 6 addresses the recovery and rebuild of greater Christchurch following the 2010/11 earthquakes. From an ecological perspective, provision of housing within the site is consistent with Chapter 6 objectives through providing new urban areas in locations that does not compromise area of indigenous biodiversity.
- 116 Chapter 7 addresses freshwater in the Canterbury region. Objectives within this chapter address sustainable and integrated management and development, and protection of waterbodies and riparian zones. From an ecological perspective, changing the zoning of the site provides opportunities to enhance freshwater values, including the riparian zone of McIntosh Drain, and develop best practice stormwater facilities, increasing water quality.
- 117 Chapter 9 addresses ecosystems and indigenous biodiversity, including the impact of pest plants and animals. Objectives include halting decline, restoration and enhancement, and protection of significant indigenous vegetation and habitats. The proposed zoning of the site from rural to urban is consistent with the Chapter 9 objectives. There are no significant ecosystems or habitat within the site. Development of greenspace within future subdivisions provides many opportunities for ecological enhancement and restoration. Any future realignment of McIntosh Drain within the SMA

will be assessed during future resource consenting phases. Realignment is expected to include a significant native vegetation planting component, particularly around the riparian zone and potential stormwater basins.

- 118 Appendix 3 provides criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity within the Canterbury Region. The criteria are largely consistent with those contained within the NPS IB. No significant areas are present within the site.

Proposed Waimakariri District Plan

- 119 The proposed Waimakariri District Plan includes various objective, policies and rules relating to development and landuse in the Waimakariri District.
- 120 Part 2 provides objectives, policies and rules around district wide matters including ecosystems and indigenous biodiversity and natural character of freshwater bodies. The ECO chapter provides regulation and protection of SNAs and other indigenous biodiversity. It includes a list of SNAs in the region and unmapped SNA habitat types. No SNAs or unmapped SNA habitat types are present within or adjacent to the site. The chapter also provides lists of specified Threatened and At Risk species likely to be present in the district, and those with a distribution limit in the district. No species listed were present on site.
- 121 The NATC chapter provides objective, policies and rules regarding preserving and restoring the natural character of waterbodies and the use of the riparian margins. There are no scheduled natural character waterbodies within the site, however McIntosh Drain is a tributary of the scheduled Waimakariri River. Future development of the site is expected to include enhancement to McIntosh Drain, including the riparian zone.

MATTERS RAISED BY SUBMITTERS

- 122 I have reviewed submissions raised in relation to the development of the site, that are specific to ecology. I respond to these points below.

Ecological corridor

- 123 Several submitters expressed the desire to either retain or develop an ecological corridor east of Sutherland Drive. I have assumed their intention is for the corridor to extend along the entire length of the existing development

of Sovereign Palms and Moorcroft, i.e the western boundary of the North Block.

- 124 Submitters were concerned about the reduction and fragmentation of habitat as a result of the existing rural area changing to residential land use.
- 125 I note the Moore Block currently provides very limited habitat values for native flora and fauna. As discussed in paragraphs 44 to 49, and 55 to 60 the site contained no significant native flora, and only common native fauna. Exotic species dominated the site, typical of a rural environment on the urban fringe.
- 126 Developing the site for housing will not result in a loss of habitat or fragmentation of existing habitat due to the lack of habitat present. The development will also include greenspace, including the intended stormwater management area to the east of the site. Once developed it will provide a longitudinal corridor of native planting, open space, and wetland habitat that will provide significantly higher ecological values than currently exist. It will connect to the corridor recently developed on the realigned section of McIntosh Road directly upstream of Beach Road, at the southern end of the North Block.
- 127 There is little ecological reason for locating a corridor along the eastern extent of the current development compared to the future development, i.e the current alignment of McIntosh Drain. From an ecological perspective, greater ecological gains can be achieved through enhancing the McIntosh Drain corridor as any revegetation of this area will provide significant benefits for the freshwater environment as well as terrestrial habitat.
- 128 The existing stormwater pond with the site, labelled as 'Western' on Figure 4, will be retained in future development. This feature will continue to provide a steppingstone for mobile fauna such as birds as they move between other habitats in the area. It will also continue to provide habitat for less mobile fauna such as lizards, if any are present.

Street lighting

- 129 One submitter suggested requiring lighting that limits light pollution.

- 130 From an ecological perspective, introducing light to an area that is currently dark can have detrimental effects on ecological values, particularly for birds. Lighting in a dark environment can result in birds changing their migration patterns and feeding and foraging behaviours and can result in them becoming disoriented and colliding with other birds, vegetation and structures. Lighting that can result in these effects can be sourced from buildings, street lighting, and landscape lighting.
- 131 Lighting, including different colours and intensities, is also known to be attractive to aquatic insects and can result in increased mortality rates and behavioural changes.
- 132 However, as the site is directly adjacent to existing residential development, it is not considered to be a 'dark' environment.
- 133 Despite this, there is benefit in reducing light pollution for ecological values, particularly in the eastern part of the site, where McIntosh Drain is located. If controls on lighting are provided for, the following are recommended:
- 133.1 All outside landscape lighting should be downward facing or 'hooded' to prevent light spilling upwards. Spotlighting directed on trees and on buildings should be avoided.
 - 133.2 Avoid lighting that has blue light emissions. 'Warmer' colours including red, yellow and orange colours are less disruptive.

Nutrients in waterways

- 134 Once submitter suggested an increase in housing density will increase nutrients, promoting algal growth in waterways.
- 135 The site is currently rural and is subject to stock grazing and additions of nutrients in the form of fertiliser. As such, all waterways in the area are already affected by nutrient runoff.
- 136 Transitioning to a residential area will increase impervious surfaces, as discussed in paragraphs 75 and 76, which has the potential to transport nutrients, and other contaminants to receiving waterways, in a more efficient manner than currently exists. However, as also discussed, urban development is likely to lead to an improvement in water quality through the provision of stormwater management.
- 137 Stormwater will be captured in a municipal network of drains, pipes, and infiltration areas/rain gardens or similar. Treatment occurs in these devices prior to it being discharged.

- 138 Additionally, urban development presents the opportunity to plant the riparian zone of waterways. It is intended that McIntosh Drain will be realigned, with the riparian zone significantly enhanced. A planted riparian zone provides several ecological services including filtration of overland flow, uptake of nutrients, and shade to the waterway reducing water temperatures and therefore making conditions less favourable for excessive algal growth.
- 139 Changing the land use to urban from rural will not result in any increased risk of algal blooms within surface water compared to what is currently present. If planned improvements to McIntosh Drain occur, water quality is likely to be significantly improved.

CONCLUSION

- 140 The North and South Blocks, and the associated SMA beyond the site boundaries, provide generally low quality habitat, dominated by exotic species. Terrestrial habitat was largely limited to grazed pasture. Freshwater habitat was characterised by constructed drains, with the highly modified but natural McIntosh Drain along the eastern boundary of the North Block, within the SMA.
- 141 The blocks themselves do not meet any of the criteria for ecological significance using the ECan guidelines, however the SMA does meet criteria, due the presence of At Risk – Declining fish within McIntosh Drain, which flows through the SMA.
- 142 Rezoning the North and South Blocks for residential use is not expected to result in a decrease in ecological values, mainly due to the low values that are currently present. Different pressures on ecological values will be generated, such as increased impervious surfaces, changing from open grassland to landscaping and gardens, and a loss of farm drain habitat.
- 143 Significant increases in ecological values can be achieved through landscaping, stormwater management and through the development of the SMA, including riparian planting and instream enhancement of the realigned McIntosh Drain. Actual and potential effects associated with any realignment will be addressed in the future during resource consent processes.
- 144 Overall, I support the proposed rezoning of the site to a residential land use. The change in zoning is not expected to result in detrimental effects on

ecological values, and is likely to result in increases in ecological values, particularly through increased botanical values, increased indigenous vegetation cover, and increased habitat for native fauna, particularly birds. When coupled with potential planting associated with future realignment of McIntosh Drain, ecological values will be significantly increased.

A handwritten signature in black ink, appearing to read 'A Coates', with a horizontal line extending from the end of the signature.

5 March 2024

Annabelle Coates

Appendix 1 – EIANZ Tables

Table 1. Criteria for assigning value to habitat/species for assessment.

Value	Determining Factors
Very High	Nationally Threatened species found in the 'zone of influence' (ZOI) either permanently or seasonally. Area rates 'High' for at least three of the assessment matters of Representativeness, Rarity/distinctiveness, Diversity and Pattern, and Ecological Context. Likely to be nationally important and recognised as such.
High	Species listed as At Risk – Declining found in the ZOI either permanently or seasonally. Area rates 'High' for two of the assessment matters, and 'Moderate' and 'Low' for the remainder OR area rates 'High' for one of the assessment matters and 'Moderate' for the remainder. Likely to be regionally significant and recognised as such.
Moderate	Species listed as At Risk – Relict, Naturally Uncommon, Recovering found in the ZOI either permanently or seasonally. Locally uncommon or distinctive species. Area rates 'High' for one of the assessment matters, 'Moderate' or 'Low' for the remainder OR area rates as 'Moderate' for at least two of the assessment matters and 'Low' or 'Very Low' for the remainder. Likely to be important at the level of the Ecological District.
Low	Nationally and locally common indigenous species. Area rates 'Low' or 'Very Low' for majority of assessment matters, and 'Moderate' for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Exotic species including pests, species having recreational value. Area rates 'Very Low' for three assessment matters and 'Moderate', 'Low' or 'Very Low' for the remainder.

Table 2. Criteria for describing the magnitude of effects (EIANZ 2018)

Magnitude	Description
Very High	Total loss of, or a very major alteration to, key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature.
High	Major loss of major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature.
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature.
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances and patterns; AND/OR Having minor effect on the known population or range of the element/feature.
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature.

Appendix 2 – Ecological significance of the Site using ECan Guidelines

Criteria	South Block	North Block	Stormwater Management Area
Representativeness			
1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.	Low (does not meet threshold) There is no indigenous vegetation with the exception of a small number of planted flaxes and cabbage trees. The site provides low quality habitat for common indigenous fauna.	Low (does not meet threshold) There is no indigenous vegetation within the site. The site provides common, low quality habitat for indigenous fauna.	Low (does not meet threshold) There is no indigenous vegetation within the site. The site provides common, low quality habitat for indigenous fauna.
2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.	Low (does not meet threshold) There is no indigenous vegetation with the exception of a small number of planted flaxes and cabbage trees. The site provides low quality habitat for common indigenous fauna in the Lower Plains ecological district.	Low (does not meet threshold) There is no indigenous vegetation within the site. The site provides low quality habitat for indigenous fauna.	Low (does not meet threshold) There is no indigenous vegetation within the site. The site provides low quality habitat for indigenous fauna.
Rarity/Distinctiveness			
3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.	Low (does not meet threshold) There is no indigenous vegetation with the exception of a small number of planted flaxes and cabbage trees. The site provides low quality habitat for common indigenous fauna.	Low (does not meet threshold) There is no indigenous vegetation within the site. The site provides low quality habitat for indigenous fauna.	Low (does not meet threshold) There is no indigenous vegetation within the site. The site provides low quality habitat for indigenous fauna. At Risk – Declining fish species present in McIntosh Drain are present in a large number of waterways within the region.
4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is Threatened, At Risk, or uncommon, nationally or within the relevant ecological district.	Low rarity value (does not meet threshold) Common native and exotic avifauna species present only. No At Risk or Threatened species observed on site, or expected to be present on site.	Low rarity value (does not meet threshold) Common native and exotic avifauna species present only. No At Risk or Threatened species observed on site, or expected to be present on site.	Moderate (meets threshold) At Risk declining fish are known to be present in McIntosh Drain. The remainder of the site provides low quality habitat for terrestrial indigenous fauna

<p>5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.</p>	<p>Does not meet threshold Species present, and expected to be present, within the site and wider area are common throughout Canterbury and New Zealand.</p>	<p>Does not meet threshold Species present, and expected to be present, within the site and wider area are common throughout Canterbury and New Zealand.</p>	<p>Does not meet threshold Species present, and expected to be present, within the site and wider area are present throughout Canterbury and New Zealand.</p>
<p>6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors</p>	<p>Low distinctive value (does not meet threshold) Species and setting for habitat are common throughout Canterbury.</p>	<p>Low distinctive value (does not meet threshold) Species and setting for habitat are common throughout Canterbury.</p>	<p>Low distinctive value (does not meet threshold) Species and setting for habitat are common throughout Canterbury.</p>
<p>Diversity and Pattern</p>			
<p>7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.</p>	<p>Low (does not meet threshold) The site is too small and uniform to contain any ecological gradients. The history of farming and grazing on the site has altered it significantly from its pre human characteristics.</p>	<p>Low (does not meet threshold) The site is very uniform. It does not contain any ecological gradients. The history of farming on the site has altered it significantly from its pre human characteristics.</p>	<p>Low (does not meet threshold) The site is very uniform. It does not contain any ecological gradients. The history of farming on the site has altered it significantly from its pre human characteristics.</p>
<p>Ecological Context</p>			
<p>8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.</p>	<p>Low (does not meet threshold) Despite being an area of rural land surrounded by residential development, the vegetation and habitat within the site does not provide any significant habitat, or linkages. There is some potential that the exotic trees may provide roosting habitat for birds moving between the coast and the Waimakariri River, however there are significant other areas in close proximity that will remain unaffected by the proposal (e.g. stormwater reserve to the east, Kaiapoi residential red zone 500m SE).</p>	<p>Low (does not meet threshold) There is some potential that the site provides low quality 'stepping stones' between the Waimakariri River, Ashley River, and the coast for common birds such as paradise ducks. However, there are significant other areas in close proximity that will remain unaffected by the proposal (e.g. Kaiapoi residential red zone 800m S, Kaiapoi Lakes 1200m NW).</p>	<p>Low (does not meet threshold) There is some potential that the site provides low quality 'stepping stones' between the Waimakariri River, Ashley River, and the coast for common birds such as paradise ducks. However, there are significant other areas in close proximity that will remain unaffected by the proposal (e.g. Kaiapoi residential red zone 800m S, Kaiapoi Lakes 1200m NW).</p>
<p>9. A wetland which plays an important</p>	<p>Low (does not meet threshold)</p>	<p>Low (does not meet threshold)</p>	<p>Low (does not meet threshold)</p>

hydrological, biological or ecological role in the natural functioning of a river or coastal system.	There is no wetland habitat within the site. The site is dominated by grazed exotic pasture with some associated pasture weeds.	There is no wetland habitat within the site. The site is dominated by managed exotic pasture with some associated pasture weeds.	There is no wetland habitat within the site. The site is dominated by managed exotic pasture with some associated pasture weeds.
10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.	Low habitat value (does not meet threshold) Limited vegetation provides limited opportunities for habitat for indigenous species.	Low habitat value (does not meet threshold) Limited vegetation provides limited opportunities for habitat for indigenous species.	Low habitat value (does not meet threshold) Limited vegetation provides limited opportunities for habitat for indigenous species.