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Celia Wright
Operations
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Dear Celia,

Ecological assessment of Rural Urban Fringe land – John Paterson Drive, Halswell

Proposal and scope

A block of land in the southern urban fringe of Halswell is proposed to be converted from rural land into a residential development. This is termed the Proposed Development Area (PDA). As part of the requirements for the Structure Plan and Plan Change to the Christchurch District Plan (CDP), Urban Estates have requested an ecological assessment. AEL has been engaged to advise on the project in two stages (Stage 1 - Initial advice and high-level assessment, Stage 2 – Plan Change Application). Stage 1, addressed by this memorandum, required the identification of streams and wetlands, areas of terrestrial flora to be retained, and to advise on possible ecological mitigation strategies. The upper swale of Knights Stream is present along a portion of the southern and southeastern boundary of the proposed development area (App. I, Fig. i). Knights Stream is classified as a “Spring-fed Plains” waterway on the ECan River network layer in the Canterbury Maps Viewer GIS.

Field Survey

To assess the ecologically significant areas of the proposed development area, surveys were conducted over two days.

The first visit (15/10/2025) was to investigate any aquatic ecological values associated with Knights Stream in the vicinity of the PDA. During the second visit (25/11/2025), a ground-based ecological assessment was conducted within the proposed development area, using a combination of in-vehicle and on-foot surveying. The aim was to identify and denote areas of ecological significance including streams, wetlands, and important terrestrial vegetation. A handheld GPS receiver was used to geo-reference habitats of interest and record the tracks of the survey. The map in App. I, Fig. i shows the survey tracks in yellow, indicating the areas covered during the site visits.

Ecology within and downstream of the proposed development area

At the time of survey, Knights Stream was dry in the vicinity of the proposed development area (App. II, Fig. i). No wetland vegetation or characteristics were observed in or adjacent to the channel, indicating that the channel is only watered during significant rainfall events. The soil in the channel was clearly insufficient to retain sufficient moisture to support wetland plants (i.e. hydrophytes). Unsurprisingly, no aquatic fauna or flora were noted.

The channel bed formed a swale dominated with pasture grasses and terrestrial vegetation as well as some bare ground and cobbles. The banks and surroundings of the stream bed included mature pine (*Pinus* sp.) and poplar (*Populus* spp.) trees as well as NZ flax/harakeke (*Phormium tenax*), cabbage trees (*Cordyline australis*), and shrubs such as blackberry (*Rubus fruticosus*) (App. II, Fig. ii). These plant species indicate that this reach of Knights Stream is terrestrial in nature, and the absence of hydrophytes implies the presence of surface water is infrequent.

In the northern section of the land block, a corridor of native trees and shrubs bordered John Paterson Drive, including cabbage trees, ribbonwood/mānatu (*Plagianthus regius*), NZ flax/harakeke, New Zealand broadleaf (*Griselinia littoralis*) and kowhai (*Sophora microphylla*) (App. II, Fig. v-ix). Further south along John Paterson Drive, the vegetated roadside was composed of a treeline of introduced conifer, probably macrocarpa.

A total of three native bird species were also noted during the ecological survey. Numerous pukeko (*Porphyrio melanotus*) were observed in the northern area along with welcome swallows (*Hirundo neoxena*) and spur-winged plovers (*Vanellus miles*). These birds all have a conservation status of “Not Threatened” (Robertson *et al.* 2021).

There was no wetland areas identified during the survey of the proposed development area. Nor did we observe any hydrophyte zonation within the pastoral area, or natural landform consistent with old fluvial channels.

Surface water in Knights Stream, well downstream of the development area boundary (c. 450 m) was attributed to a discharge from a nearby stormwater retention basin discharge adjacent to 12 Kahurangi Road (App. II, Fig. iii, iv). Some hydrophytic plant growth was apparent there. A discharging spring was observed further downstream by Marshs Road culvert, providing permanent surface water to this section of Knights Stream (App. II, Fig. v, vi).

Discussion

The proposed development area was devoid of natural wetlands as referred to in the NES-F, and described in the NPS-FM and echoed in the LWRP and ChCh District Plan. The land use in the area is predominantly agricultural, therefore pastoral grassland is the main vegetation form. The ephemeral course of Knights Stream, where it borders the development, also lacked surface water and wetland vegetation (App. II, Figs. i-ii). Therefore, the waterway in this location is not subject to the NES-F regulation.

Patches of dryland native flora were observed, especially on the western bank of Knights Stream, adjacent to the eastern boundary of the proposed development area. Improving Knights stream by planting riparian species along the banks would create a suitable flyway for birds. In the riparian areas it is recommended to include tussock sedge/pūrei, harakeke/flax, kowhai, and cabbage trees. We recommend the use of woollen Dagmat™ ground matting, so new plantings retain soil moisture and inhibit weed growth around plantings. We also recommend the removal of weeds and competitive exotics.

Over the course of the land survey, several native birds were observed, being species associated with pastoral land. The development initiative provides an opportunity to enhance and extend existing habitat and reduce fragmentation. All native vegetation in the Knights Stream riparian corridor and the northern corridor should be retained, and incorporated into future native plantings. This will enhance native bird and flighted macroinvertebrate habitat and dispersal. Further detail can be provided following the release of a draft development plan.

Similarly, if the native corridor was extended and connected along connector roadways in the land block, from John Paterson Drive, this would enhance connectivity allowing birds to disperse through the urbanised area. We note, for example, tree canopy pathways traversing the proposed development area from west to east which link to vegetated boundaries of well-treed properties bordering Busch Lane. Retention of these obvious bird habitats, and their pathways to adjacent tree copses to the west along Busch Lane will be of ecological benefit. At this time, bird flyways to the north and south of the development area are less obvious, as they coincide with high-density residential areas and industrial land. To the east, the connection to the vegetated upper Knights Stream in possibly the most apparent ecological pathway, even though the aquatic habitat is ephemeral at best.

Lacking perennial water, and NES-F wetland status, the ecology of the Knights Stream habitat adjacent to the proposed development will not benefit from development setbacks that would otherwise support aquatic ecology. We recommend a development setback sufficient to enhance bank stability, prevent soil erosion, remove a large proportion of nutrients from overland stormwater flow, and provision of bush bird habitat. Without the objective of supporting aquatic ecology, which requires greater widths, a minimum development setback of 6 m would be suitable, but at this width some weed infestation into indigenous vegetation can be expected, and the indigenous vegetation may not be self-sustaining (Parkyn 2004).

Connection between native habitat patches will promote higher biodiversity by attracting more species and improving existing ecology. Attention should be given to the diversity and assemblage of native flora that are planted on the site. A greater diversity of plants provides habitat for a broader range of bird species (Lukies, 2020). Currently, the resident birds are associated with dry grassland, but linking copses of semi-mature native trees and shrubs will encourage more bush bird colonisation. It is therefore recommended to include trees such as, broadleaf, five finger, kowhai.

Recommendations

While aquatic habitats were absent, to enhance the biodiversity in the proposed development and to encourage the formation of ecological corridors for terrestrial birds and insects, the following measures are recommended:

- Retain and enhance all habitats with mature native vegetation, especially the Knights Stream riparian flora and the northern dispersal corridor along John Paterson Drive.
- Where possible, extend native plant corridors to provide dispersal paths and tree lines to the vegetated boundary of the Busch Lane properties.
- Improve Knights Stream corridor with further native riparian planting, weeding, and using Dagmat™ around the plantings to inhibit weed growth and retain soil moisture.
- A minimum development setback of 6 m should be retained along the Knights Stream corridor, to sufficiently filter nutrients from stormwater and provide indigenous bush bird habitat.

Yours sincerely,



Mark Taylor Jack Grehan, Riley Payne

References:

- Parkyn, S. M. 2004. Review of Riparian Buffer Zone Effectiveness. Ministry of Agriculture and Forestry, Wellington. *MAF Technical Paper No: 2004/05 No. No. 2004/05*. 31 p.
- Robertson, H. A.; Baird, K.; Elliott, G.; Hitchmough, R.; McArthur, N.; Makan, T.; Miskelly, C. M.; O'Donnell, C. F. J.; Sagar, P. M.; Scofield, R. P.; Taylor, G. A.; Michel, P. 2021. Conservation status of birds in Aotearoa New Zealand, 2021. Department of Conservation, Wellington. *No. 43 p.*

Appendix I. Site Map

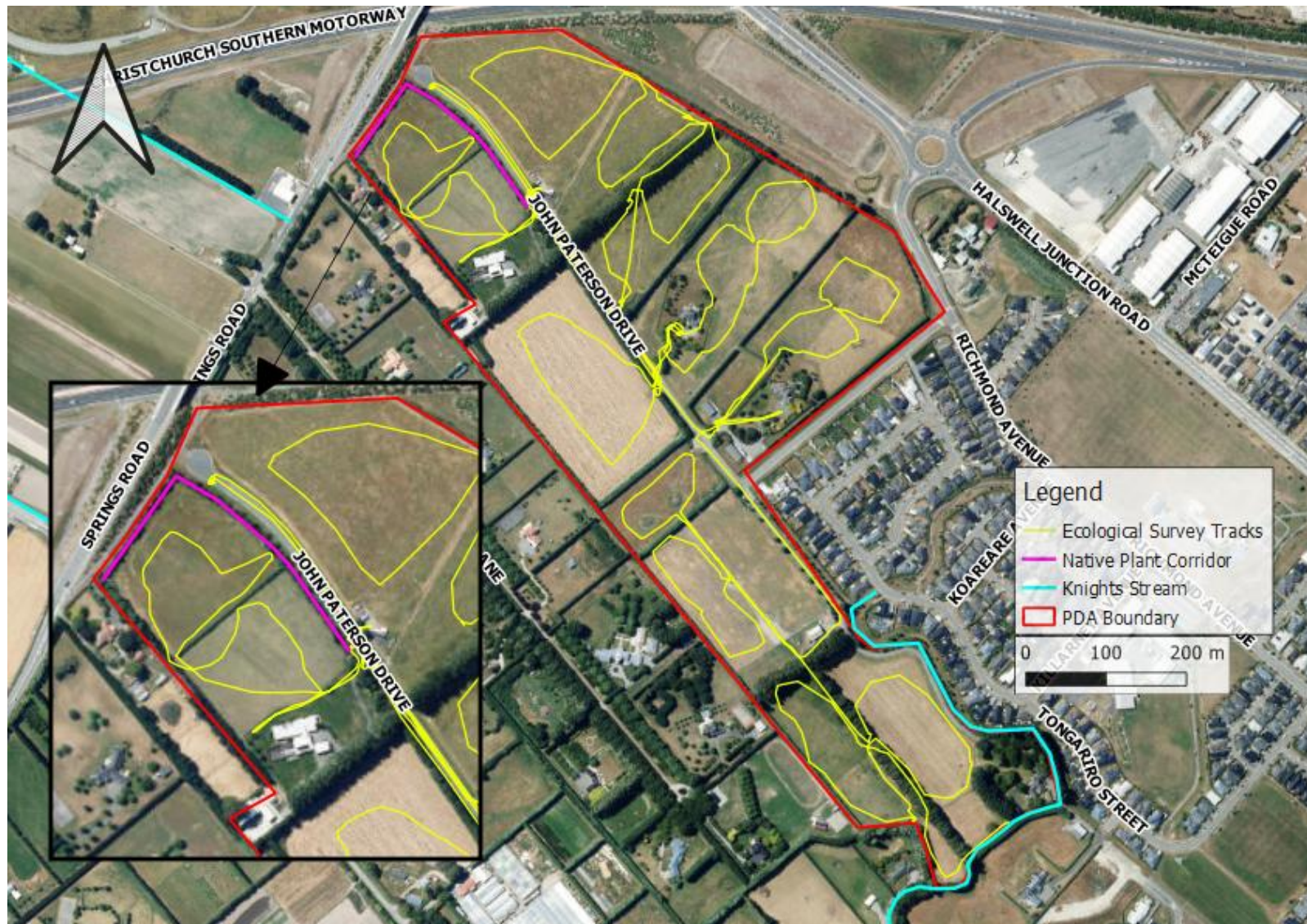


Figure i. Overview map showing PDA boundary, ecological survey tracks, a native plant corridor, and Knights stream. Note that John Paterson Drive is misspelt in the LINZ GIS layer, and Google Earth.

Appendix II. Site photographs (25/11/2025)



Figure i. The bed of the ephemeral Knights stream was dry with patches of bare soil. Native vegetation on the photograph left bank was composed of flaxes, with exotic pines on the right.



Figure ii. The bed of Knights Stream with terrestrial grasses in the channel bed and buttercup.



Figure iii. Knights stream, c. 450m downstream of PDA looking north with puddled surface water.



Figure iv. Knights stream surface water and hydrophytes.



Figure v. Knights stream with permanent surface water at Marshs Road culvert, c. 550m downstream of PDA.



Figure vi. Discharging spring in Knights Stream by Marshs Road culvert, c. 550m downstream of PDA.



Figure vii. Native plant corridor view from northwestern paddock, south of John Paterson Drive.



Figure viii. Native plant corridor view from northwestern paddock. Flax in foreground and kowhai in background.



Figure ix. Looking north from the north-eastern paddock, Northern boundary of PDA. On the photograph left is the native vegetation corridor along John Paterson Drive. On photograph right, the continuation of native vegetation on the right outside of PDA (bushed bund of the Southern Motorway).