Ōtautahi-Christchurch

Proposed lizard translocation release sites

Scoping report / 6th May 2024

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Christchurch City Council

Approvals Panel			
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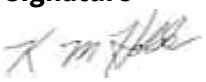
Reviewed by	**Kay Holder** Manager, Regional Parks, Parks Unit.	**Date** 15th April 2024	**Signature** 
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Approved by	**Rupert Bool** Head of Parks, Parks Unit.	**Date** 6th May 2024	**Signature** 

Contents

Introduction

The greater Christchurch area provides habitat for up to five species of native lizard, all of which are 'absolutely protected' under the Wildlife Act (1953, s63 (1) (c)) and therefore they may not be harmed, disturbed or killed without a Wildlife Act Authority from the Department of Conservation (DoC). Loss and alteration of habitat has been a major cause of decline of many lizard species in Aotearoa-New Zealand (DoC 2019), and in Ōtautahi-Christchurch lizards are present in many areas scheduled for development – including Council projects. However, one tool that we use to manage lizard populations in the face of such developments is salvage from the site and transfer to another suitable site where they are able to establish a new viable population. In some cases, these translocations may establish completely new lizard populations at the release sites, whereas in others they may supplement an existing but small population thereby improving its long-term population viability.

Figure 1: *Southern grass skink (*Oligosoma aff. polychroma*, Clade 5 (Photograph C. McClure 2023).*

The current situation in Ōtautahi-Christchurch is that we have far more projects that are resulting in loss of lizard habitat than we have suitable release sites for. This places significant infrastructure projects at risk of not being able to be delivered until proposed release sites are at a stage that they are able to receive lizard translocations. This often means that Council will not meet its levels of service in terms of the delivery of the Annual and Long-Term Plans. Also, it means that we may not meet various consent conditions (e.g., the global stormwater discharge consent which requires us to manage stormwater quality through the establishment of large stormwater treatment facilities on sites that often support significant lizard populations). We are therefore in urgent need of a plan to establish a range of sites across the city that can be enhanced and managed in a state suitable for lizard translocations.

This report identifies 38 sites across ten of Ōtautahi-Christchurch's city wards (Refer Figure 2 and Table 1) that we propose to develop and manage for receiving lizard translocations. Receiving sites such as these are often poorly considered in lizard salvage applications, yet it is one of the most important elements of the salvage operation. A receiving site must allow for growth of a sustainable population, have legal protection and remain suitable over time for the lizard species in question.

Based on receiving site considerations criteria set out by DoC (see below), we have assessed the 38 sites as either having a range of existing attributes that lend themselves to lizard releases or could easily be enhanced to a stage that they could do so in the short-to-medium term. The report lists and describes these sites on a ward-by-ward basis and identifies a list of actions required to bring the sites to a state where they are able to receive lizards, however does not consider funding sources nor ongoing operational considerations. These will be determined on a case-by-case basis with asset owners via the development and approval of individual Lizard Management Plans.

Receiving site considerations

A salvage and transfer proposal needs to have particular regard to the following components when selecting a receiving site (DoC 2019):

The site must be ecologically appropriate and have long-term security.

- ✓ It must be suitable through time for the lizard species being salvaged.
- ✓ The numbers and patterns of habitat use of lizard species already present at the receiving site must be understood (e.g., there must be an existing population of the species being salvaged adjacent to the receiving site, or enough assurance that there will be adequate animals salvaged to establish a genetically viable population).
- ✓ It must be an appropriate distance from the salvage site to ensure lizards cannot move back into harm's way (lizard exclusion fences in combination with traps can be used to keep lizards out of development areas), but as close as possible to ensure lizards are moved to site(s) that very closely resemble those that they have come from in terms of microhabitat and climate.
- ✓ Post-release monitoring must be achievable if appropriate.
- ✓ The location must be within the species' natural geographic range. It is unlikely that DOC would support lizards being transferred to areas outside their known or likely historic geographic ranges.
- ✓ There must be no mixing of genetically structured populations.

The habitat at the site must be suitable for the salvaged species.

- ✓ It should be predominantly indigenous vegetation that is sufficiently large and continuous to support both the translocated lizards and the eventual established population over all the species' life history stages.
- ✓ It must contain sufficient resources (food, cover, retreats) for both the salvaged lizards and the eventual established population, be buffered from climatic extremes (drought, cold) and not located in areas that are prone to flooding or coastal erosion.
- ✓ There must be sufficient resources for both resident and translocated lizards or 'improved' for lizards to ensure resources are available.
- ✓ Ongoing management must improve habitat for lizards over timeframes that are ecologically relevant.

The site must provide protection from predators.

- ✓ Habitat at the site must be secure from predators or effective pest control must be in place to allow the salvaged lizards to establish a population.
- ✓ Where predators have been eradicated, there have to be appropriate biosecurity procedures to stop them reinvading.

The site must be protected from future human disturbance.

- ✓ Land tenure at the site must ensure long-term protection from disturbance.

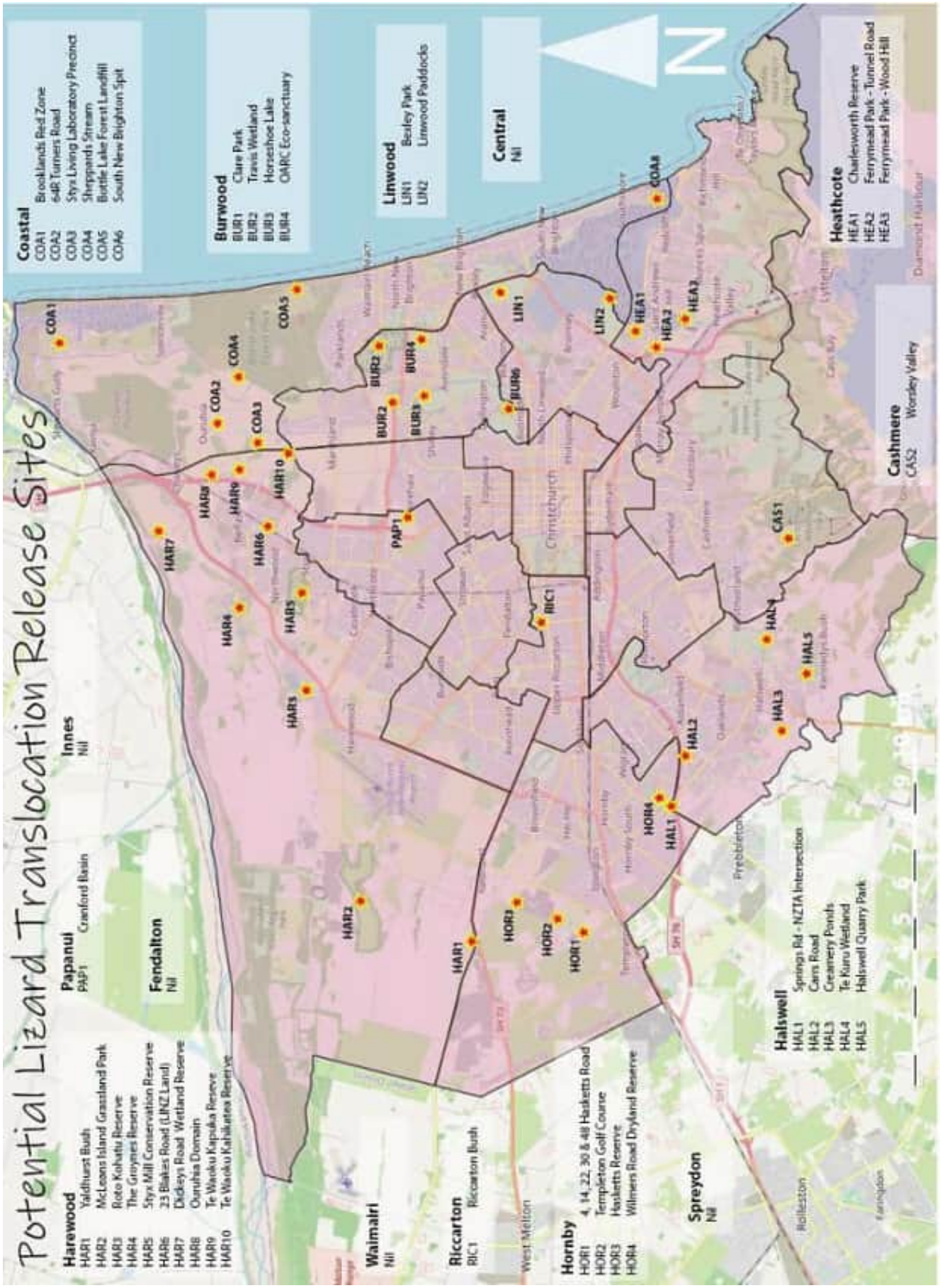
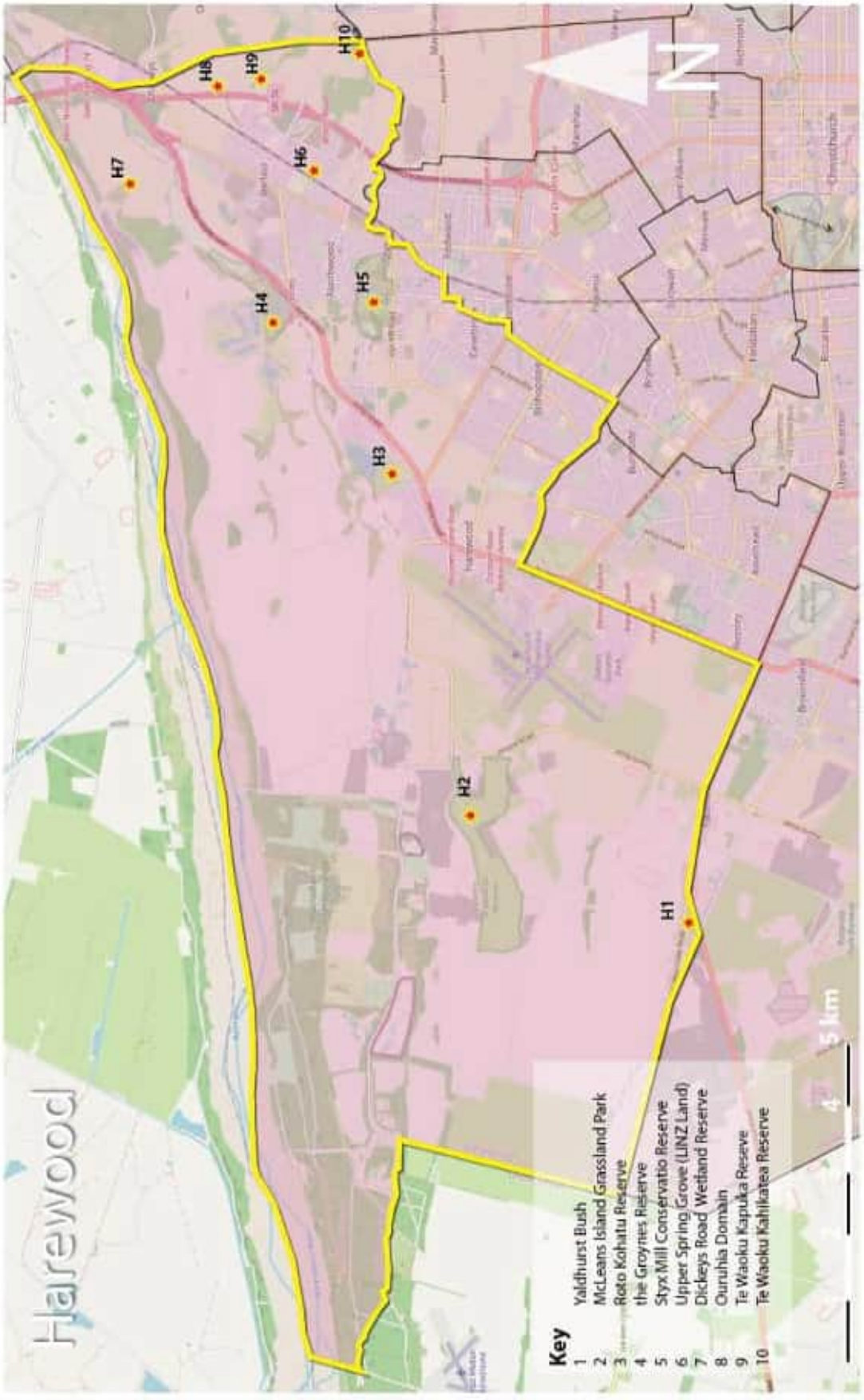


Figure 2: *Map of the Ōtautahi-Christchurch city area showing 38 potential lizard release sites across ten ward areas.*

Table 1: *List of 38 proposed lizard release sites across the Ōtautahi-Christchurch city area, including potential areas (m2) within each site, rough orders of cost for restoration, and propriety ranking based on suitability. Sites marked with an asterisk (*) indicate a per-hectare rate where the extent of restoration has not yet been determined.*

Site Number	Site Name	Park Type	Area	Priority
Harewood Ward				
HAR1	Yaldhurst Bush	Local/Community Park	23,000 m2	2
HAR2	McLeans Island Grassland Park	Regional Park	15,000 m2	1
HAR3	Roto Kohatu Reserve	Regional Park	75,000 m2	1
HAR4	The Groynes Reserve	Regional Park	20,000 m2	3
HAR5	Styx Mill Conservation Reserve	Regional Park	35,000 m2	1
HAR6	23 Blakes Road		18,000 m2	3
HAR7	Dickeys Road Wetland	Regional Park	25,000 m2	2
HAR8	Ouruhia Domain	Sports Park	6000 m2	1
HAR9	Te Waoku Kapuka Reserve	Regional Park	6800 m2	1
HAR10	Te Waoku Kahikatea Reserve	Regional Park	2500 m2	2
Papanui Ward				
PAP1	Cranford Basin	Utility	25,000 m2	3
Coastal Ward				
COA1	Brooklands Red Zone*	Red Zone Park	10,000 m2	1
COA2	64R Turners Road	Regional Park	5000 m2	3
COA3	Styx Living Laboratory Precinct	Regional Park	7000 m2	1
COA4	Sheppards Stream	Regional Park	7500 m2	2
COA5	Bottle Lake Landfill*	Regional Park	10,000 m2	2
COA6	South New Brighton Spit	Regional Park	30,000 m2	1
Burwood Ward				
BUR1	Clare Park	Regional Park	15,000 m2	3
BUR2	Travis Wetland	Regional Park	2500 m2	3
BUR3	Horseshoe Lake*	Regional Park	10,000 m2	3
BUR4	OARC – Waitakiri Eco-Sanctuary	Red Zone Park	10,000 m2	1
Linwood Ward				
LIN1	Bexley Park	Local/Community Park	10,000 m2	2
LIN2	Linwood Paddocks	Regional Park	10,000 m2	2
Cashmere Ward				
CAS1	Worsleys Valley	Regional Park	65,000 m2	3
Heathcote Ward				
HEA1	Charlesworth Reserve	Regional Park	10,000 m2	1
HEA2	Ferrymead Park – Tunnel Road	Regional Park	5000 m2	2
HEA3	Ferrymead Park – Wood Hill	Regional Park	10,000 m2	1
Halswell Ward				
HAL1	Springs Road Intersection	Waka Kotahi/NZTA	17,000 m2	1
HAL2	Carrs Road Reserve	Sports Park	25,000 m2	2
HAL3	Creamery Ponds	Local/Community Park	2500 m2	3
HAL4	Te Kuru Wetlands	Utility Park	7500 m2	1
HAL5	Halswell Quarry Park*	Regional Park	10,000 m2	2
Hornby Ward				
HOR1	4, 14, 22, 30 & 48 Hasketts Road	Property	20,000 m2	3
HOR2	Templeton Golf Course	Sports Park	50,000 m2	2
HOR3	226 Hasketts Road	Property	40,000 m2	2
HOR4	Wilmers Road Drylands Reserve	Regional Park	15,000 m2	1
Riccarton Ward				
RIC1	Pūtagringamotu-Riccarton Bush	Riccarton Bush Trust	78,000 m2	3
TOTAL			**754,300 m2**	

Harewood Ward



Yaldhurst Bush (HAR1)

This site is located on droughty and shallow Waimakariri soils over sand & rounded greywacke river stones. The mid-aged plains ecosystem that this site would naturally support a broad suite of native plants that would in-turn support lizard populations. Native woodland, shrubland and riparian planting commenced at Yaldhurst Bush in the late 1990s and now covers approximately 3.7 hectares – approximately 60% of the six-hectare reserve. The unplanted areas are currently maintained as mown grass and are used informally for passive recreation including dog walking.

While some areas of the reserve could be ready for lizard translocation immediately, there remains great potential to build on the existing plantings to both expand and enrich them with a suite of native plant species that more closely represent former Canterbury Plains ecosystems. This reserve could be completely restored to its former pre-human state by restoring the remaining grass areas and managing the area as a predator proof sanctuary - noting that its restored area would be approximately the same size as Pūtagringamotu-Riccarton Bush.

A predator proof fence could be considered for this reserve as part of habitat enhancement. However, more thought will be needed around how to protect the fence from vehicle accident damage on the busy State Highway and Old West Coast Road, and also how to best construct and manage the fence along its interface with the private land immediately to the west to incorporate the required clear zone along the outside of the fence.

Item	Note
Prepare planting area (23,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 10,000 plants	Plants at (average) 1.5 m centres
Plant 10,000 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Predator proof fence (1250 m)	Full-specification exclude-all fence including gates
Crusher dust path (650 m)	To provide recreational access around site
Interpretation material & signage	To highlight and reinforce purpose of reserve
TOTAL	

Mcleans Island Grassland Park (HAR2)

This site is located on droughty and shallow Selwyn soils over greywacke river stones. The young plains ecosystem supports significant remnant indigenous vegetation including threatened and uncommon plant species. These include a suite of native plants that support existing lizard populations.

Over the past ten-to-twenty years, small areas of restoration planting have been established, however over the past two years this scale of these plantings has significantly increased, and a Reserves Act management plan and a landscape development plan are currently being prepared to inform future development and management of the site.

While the existing lizard habitat within McLeans Island Grassland Park remains sparse, lacks cover/refuge and is heavily grazed, there is immediate opportunity within existing restoration planting areas to fence off cells to provide areas of ranker grass. Once stock is excluded through fencing, cover would establish quickly. Therefore, once minimum cell size is determined, this approach can be incorporated into restoration planning at the site.

Note that McLeans Island Grassland Park has already been used as a lizard release site recently. This project had entailed a small degree of habitat enhancement, however, to-date there has been no follow-up management nor post release lizard monitoring. As a result, this has been a poor example of other Council business units using parks to compensate for lizard habitat loss or disturbance on their capital infrastructure projects.

Item	Note
Prepare planting area (15,000 m2)	Preparation method to be determined
Supply 6500 plants	Plants at (average) 1.5 m centres
Plant 6500 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine scale habitat features	
TOTAL	

Roto Kohatu Reserve (HAR3)

Roto Kohatu Reserve in Northwest Christchurch consists of former gravel pits that have been developed as flatwater recreation lakes, and a capped landfill. A Reserves Act management plan and an accompanying development plan was approved and adopted by Council in 2022 and included provision for an extensive area of lizard habitat and/or plant conservation on the southern side of the former landfill. This proposed habitat area covers more than 7.5 hectares, and although listed as a low priority for Roto Kohatu Reserve itself, it is a much higher priority for the city and could be initiated immediately.

Item	Note
Prepare planting area (75,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 27,000 plants	Plants at (average) 1.7 m centres
Plant 27,000 plants	Contract and or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Crusher dust path (950 m)	To provide recreational access around site
Interpretation material & signage	To highlight and reinforce purpose of reserve
TOTAL	

The Groynes Reserve (HAR4)

The Groynes Reserve is dominated by wide open areas of mown amenity turf, particularly towards the northwest end of the reserve. These areas are used for a low level of informal picnicking and for carparking for the annual 'Take a Kid Fishing' day. Devoting such large areas of turf for car parking for one annual event represents a significant lost opportunity in terms of habitat restoration. It also results in significant mowing-related carbon emissions. Soils within The Groynes Reserve include lush older plains ecosystems but are dominated by dry/stony young and mid-aged ecosystems. These latter ecosystems would naturally support a broad suite of native plants that would in-turn support lizard populations.

Depending on competing uses for open space at The Groynes (e.g., picnicking, passive recreation), there could be up to two-hectares available to develop as habitat that would support lizards. This habitat type would complement other immediately adjacent forest, shrubland and riparian restoration areas that already cover a significant area and make up the Schedule-A Site of Ecological Significance in the Christchurch District Plan.

Item	Note
Prepare planting area (20,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 6500 plants	Plants at (average) 1.7 m centres
Plant 6500 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Crusher dust path (200 m)	To provide recreational access around site
Interpretation material & signage	To highlight and reinforce purpose of reserve
TOTAL	

Styx Mill Conservation Reserve (HAR5)

Like The Groynes Reserve, soils at Styx Mill Conservation Reserve include those of the lush older plains ecosystems but are dominated by dry/stony young and mid-aged ecosystem soils. These latter ecosystems would naturally support a broad suite of native plants that would in-turn support lizard populations, and because of this the site has already been identified as having suitable habitat and has begun to be used for lizard translocations. Suitable areas within Styx Mill Conservation Reserve include the peninsula area between the two main ponds where recent lizard releases have taken place[1], and on dry area sat the eastern end of the reserve.

There is already extensive predator trapping occurring at the reserve, and the reserve is planned to be fully enclosed within a predator proof fence. Two-thirds of this fence has been constructed as a cat & dog proof fence, and it is planned to in-time upgrade this to an 'exclude-all' fence and complete the remaining un-fenced section. However, this aspiration is currently un-funded.

Item	Note
Prepare planting area (3.5 ha)	Blanket spray of existing grass areas (two passes)
Supply 15000 plants	Plants at (average) 1.7 m centres
Plant 15,000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Crusher dust path (500 m)	To provide recreational access around site
Interpretation material & signage	To highlight and reinforce purpose of reserve
Upgrade predator fence (1800 m)	Re-clad existing fence with exclude-all mesh and repair,
New predator fence (1350 m)	Includes pedestrian gate and waterway crossing
TOTAL	

[1] Multiple projects should be contributing to planting and habitat establishment in this area, however for some reason this has not been occurring.

23 Blakes Road - Upper Spring Grove (HAR6)

This 1.8 ha parcel of land is currently owned by Land Information New Zealand (LINZ). It borders Ka Putahi Creek to the south and is contaminated and landlocked. The property has been un-maintained in recent years and left to grow as rank grass. As a result, it may already support a lizard population.

However, due to its size, limited access, and rough nature, it may have potential as a lizard translocation site if contaminants can be effectively managed in-situ (noting that capping material could be won from one of several of the planned Pūharakekenui-Styx catchment stormwater facility excavations. Council staff are currently investigating acquiring this land from LINZ as part of the Ka Putahi Creek reserve network, however, will be subject to both funding and issues concerning its contamination. However, if no public access is provided, remediation may only be minimal, or possibly not required at all.

Item	Note
Property acquisition	Based on Council's capital value estimate
Prepare planting area (1.8 ha)	Blanket spray of existing grass areas (two passes)
Supply 15000 plants	Plants at (average) 1.2 m centres
Plant 15,000 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Fencing (600 m)	Install fencing to ensure no public access (includes gates)
TOTAL	

Dickeys Road Wetland Reserve (HAR7)

This 16.5-hectare wetland complex covers two parcels of land of approximately equal size that are owned separately by the Department of Conservation and the Christchurch City Council. The City Council's land contains an area of approximately 2.5 ha of former landfill that is now considerably higher and drier than the surrounding wetland areas. This higher area would ideally be restored to a mid-aged ecosystem indigenous shrubland mosaic that would support lizards.

The Councils Parks Ecologist has recently observed lizards at this site. However, if the resident population is only small, further planting, other habitat enhancements and predator control would make this site a suitable candidate for future lizard translocations.

Item	Note
Prepare planting area (2.5 ha)	Blanket spray of existing grass areas (two passes)
Supply 11,000 plants	Plants at (average) 1.5 m centres
Plant 11,000 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Ouruhia Domain (HAR8)

Along the northern ban of Ka Putahi Creel, Council and community have established approximately 2.3 hectares of floodplain and river terrace planting. Although large areas of the site are dominated by moist & deep mid-aged Waimakariri soils, there are large areas (>0.5 ha) that are more closely aligned with much younger soils with gravels near the surface. These soils would naturally support a broad suite of native plants that would in-turn support lizard populations.

Recent surveys have detected a skink at the site however, this detection is likely to represent a small population. Further habitat enhancement through planting targeted species, incorporation of fine-scale habitat features, and predator control would help the site support a larger population associated with translocation project.

Note: There may be potential to work with Waka Kotahi (NZTA) to improve lizard habitat within their immediately adjacent motorway corridor plantings. The Council's herpetologist will continue to consult with NZTA on this opportunity.

Item	Note
Prepare planting area (0.6 ha)	Blanket spray of existing grass areas (two passes)
Supply 3000 plants	Plants at (average) 3 m centres throughout existing planting
Plant 3000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Interpretation	
Crusher dust path (330 m)	Required before lizard release
TOTAL	

Te Waoku Kapuka Reserve (HAR9)

As with the Ouruhia Domain site, Council and community have established approximately two hectares of floodplain and river terrace planting along the true right bank of Ka Putahi Creek within Te Waoku Kapuka Reserve. These plantings have been established on older plains ecosystems soils, however, there are large areas towards the western end of the reserve that are more suited to shrubland type vegetation consisting of native plants that would support lizard populations.

Further enhancements at this reserve that would support lizards would include 1) planting of the 2000 m2 Guthries Road reserve frontage, 2) planting the 5 m wide vehicle access strip running the length of the south boundary – 2800 m2 (now that vehicle access is no longer needed), and 3) in-filling the drier terrace-top plantings with species that would better support lizard populations (2000 m2).

Note: Parts of this site will be disturbed in 2025/26 to allow for the construction of a stormwater facility.

Item	Note
Prepare planting area (6800 m2)	Blanket spray of existing grass areas (two passes)
Supply 5000 plants	Plants at (average) 1.2 m centres
Plant 5000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Interpretation	
TOTAL	

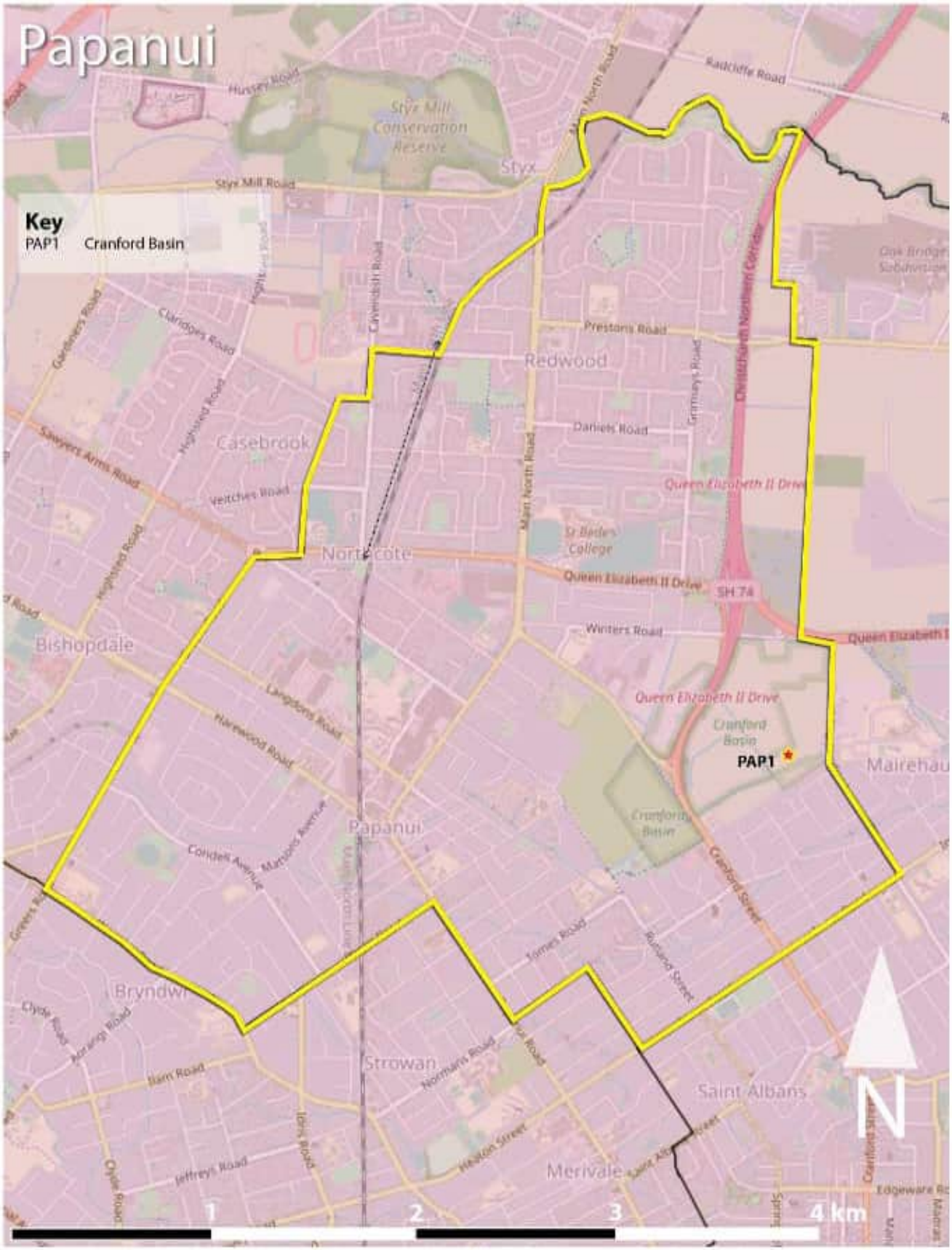
Te Waoku Kahikatea Reserve (HAR10)

Te Waoku Kahikatea Reserve is a predominantly forested ecosystem with significant waterways including the Pūharakekenui-Styx River, Kā Pūtahi Creek, Radcliffe Road Drain and Mundys Drain and a series of permanent open waterbodies. There are however some smaller areas within the forest where dry sandy conditions have favoured the growth of native scramblers and shrubs that would support lizards.

While there are only comparatively small areas suitable for the release of skinks, because the native forest areas in Te Waoku Kahikatea Reserve cover more than eight hectares (larger than Riccarton Bush), the site offers potential for the release of (e.g.) Waitaha gecko in the future as part of anticipated species reintroductions. Currently the New Zealand Conservation Trust manage an extensive network of predator trap lines throughout the reserve, and the forest has established a closed canopy with regeneration beginning to occur in the understory.

Item	Note
Prepare planting spots (2500 m2)	Prepare individual locations at (average) 5 m centres throughout
Supply 2500 niche plants	Plants at (average) 5 m centres
Plant 2500 niche plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Interpretation	
TOTAL	

Papanui Ward



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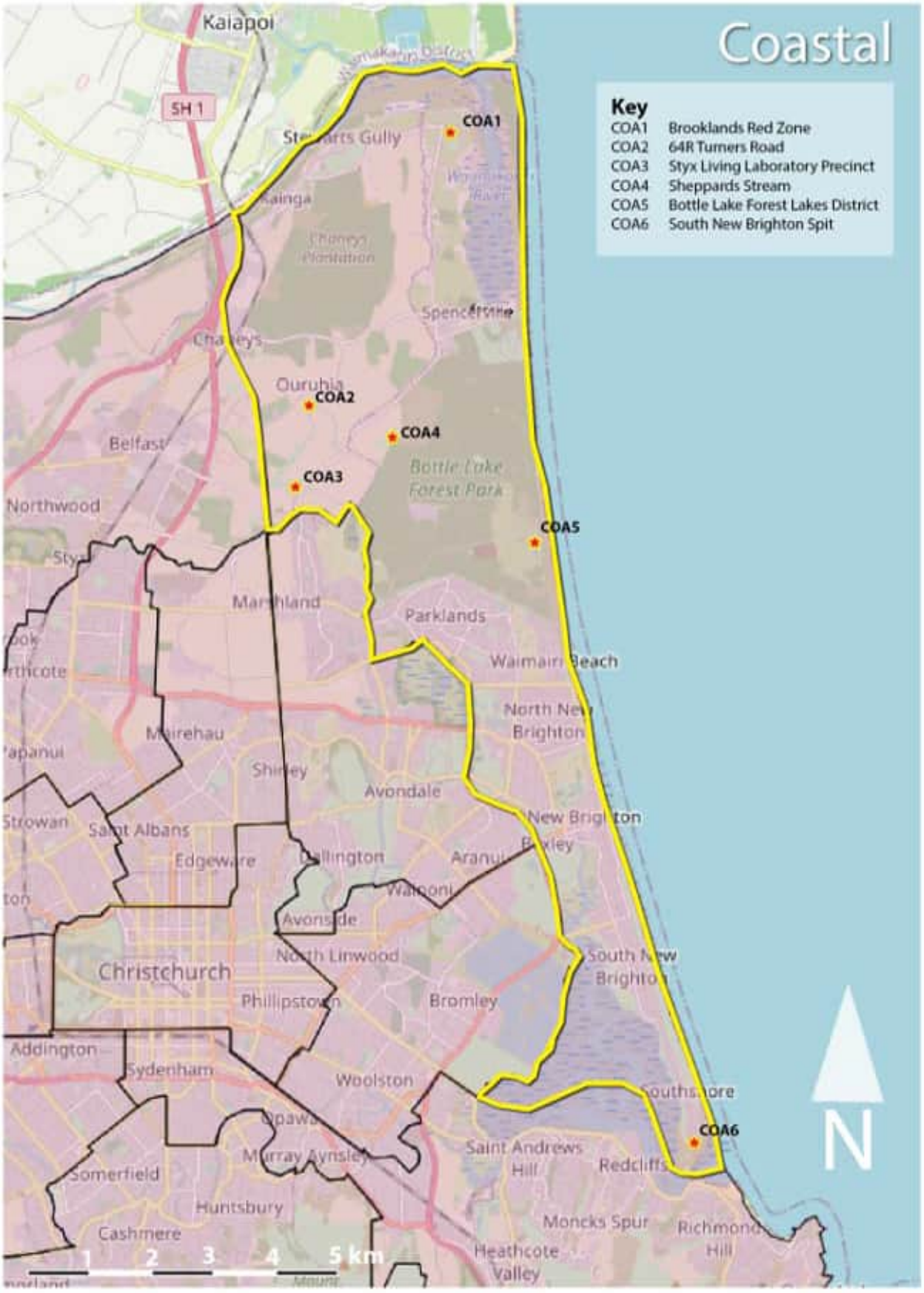
Cranford Basin (PAP1)

Large areas of Cranford Basin were acquired by Council to facilitate the completion of the Norther Arterial Roading Corridor (NARC) and to protect the basins flood storage capacity. Throughout large areas of Cranford Basin, Council and community have begun to establish an extensive kahikatea dominated forest ecosystem that aims to balance biodiversity conservation with the basin's critical stormwater management function for the wider area.

While the basin is situated on wet and peaty Waimairi and Aranui soils (a peat plains ecosystem) and is subject to regular ponding, there are drier, siltier areas around the periphery – particularly on the southeastern side - that could support lizard-friendly native vegetation communities. These drier plant communities would provide a good degree of habitat diversity and complexity within Craford Basin.

Item	Note
Prepare planting area (25,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 18,000 plants	Plants at (average) 1.2 m centres
Plant 18,000 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Coastal



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Brooklands Red Zone (COA1)

The former residential red zone (land deemed no longer suitable for residential land use following the 2010 & 2011 Christchurch earthquakes) of Brooklands covers an extensive area of what would naturally be young dune ecosystems. However, because of many decades of urban settlement in this area, soils are highly modified and diverse. Nonetheless, there is tremendous potential throughout the Brooklands Red Zone to incorporate habitats that would support lizards into the wider master-planning (currently being conducted by Boffa Miskell) and ecological restoration planning and management for the area.

Item	Note
Prepare planting area (10,000 m2)[2]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[2] Quantities are based on one hectare being established as lizard habitat, however potential area is likely to be much larger.

64R Turners Road (COA2)

This un-named Pūharakekenui-Styx River reserve contains more than two hectares of young planted native podocarp forest and restored riparian areas along the river, Humms Drain and Browns Drain. It straddles older and mid-aged plains Taitapu and Waimakariri Soils that support a diverse range of species. Currently only the core areas of the forest have been planted. However, the Styx Living Laboratory Trust in partnership with Council and community intend to establish a wide band of forest edge species around the perimeter of the existing plantings and along Humms Drain over the next two planting seasons. These proposed plantings will cover approximately 0.5 hectares and could be designed to support a small lizard population as part of an authentic forest margin.

Item	Note
Prepare planting area (5000 m2)	Blanket spray of existing grass areas (two passes)
Supply 5800 plants	Plants at (average) 1.0 m centres
Plant 5800 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Styx Living Laboratory Precinct (COA3)

At the rear of the 608 Marshland Road section of the Styx Living Laboratory Precinct, significant dry shrubland planting has taken place in recent years. At the very rear of the planted area is another area that was planted almost ten years ago, however plantings mostly failed due to a prolonged dry period and lack of maintenance. Together, these areas exceed 1.5 hectares. This site had historically consisted of sandy duneland, however this sand was mined and removed leaving a poor soil structure that does not support taller forest-type vegetation. However, what has shown to do-well throughout these areas are shrubs and scramblers that would likely provide good lizard habitat.

Item	Note
Prepare planting area (7000 m2)	Blanket spray of existing grass areas (two passes)
Supply 5000 plants	Plants at (average) 1.2 m centres
Plant 5000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Crusher dust walkway (300 m)	Important to construct prior to lizard translocation
TOTAL	

Sheppards Stream (COA4)

The Sheppards Stream reserve area consists of a remnant back-dune wetland, a northwest facing dune slope, a 500 m restored section of Sheppards Stream and extensive native forest, shrubland, harakeke and reed and rush plantings that together cover over four hectares. The old dune slope on the southeast side of the reserve has been largely un-planted and occupies droughty Waikuku soils that would naturally support a broad suite of native plants that would support lizard populations. This area covers approximately 0.75 hectares immediately adjacent to Bottle Lake Plantation. However, the adjacent forestry compartments have recently been harvested, and there is now opportunity to protect a much wider buffer to Sheppards Stream, within which additional habitat suitable for lizards could be restored.

Item	Note
Prepare planting area (7500 m2)	Blanket spray of existing grass areas (two passes)
Supply 5500 plants	Plants at (average) 1.2 m centres
Plant 5500 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Bottle Lake Landfill & Lakes District (COA5)

The former metropolitan landfill site covers more than 65 hectares. It has been capped with topsoil, sown in grass, and maintained as an open expansive mown grassland with pockets of coastal shrubland. The entire landfill area had been fenced to exclude the public from working landfill site, which provides opportunity to upgrade the fence to exclude (e.g.) hedgehogs which are known predators of lizards. While it may not be possible to establish native forest on the capped landfill, it may lend itself well to the restoration of shrublands that would support significant lizard populations.

Item	Note
Prepare planting area (10,000 m2)[3]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[3] Quantities assume that one hectare of the wider site is established as lizard habitat.

South New Brighton Spit (COA6)

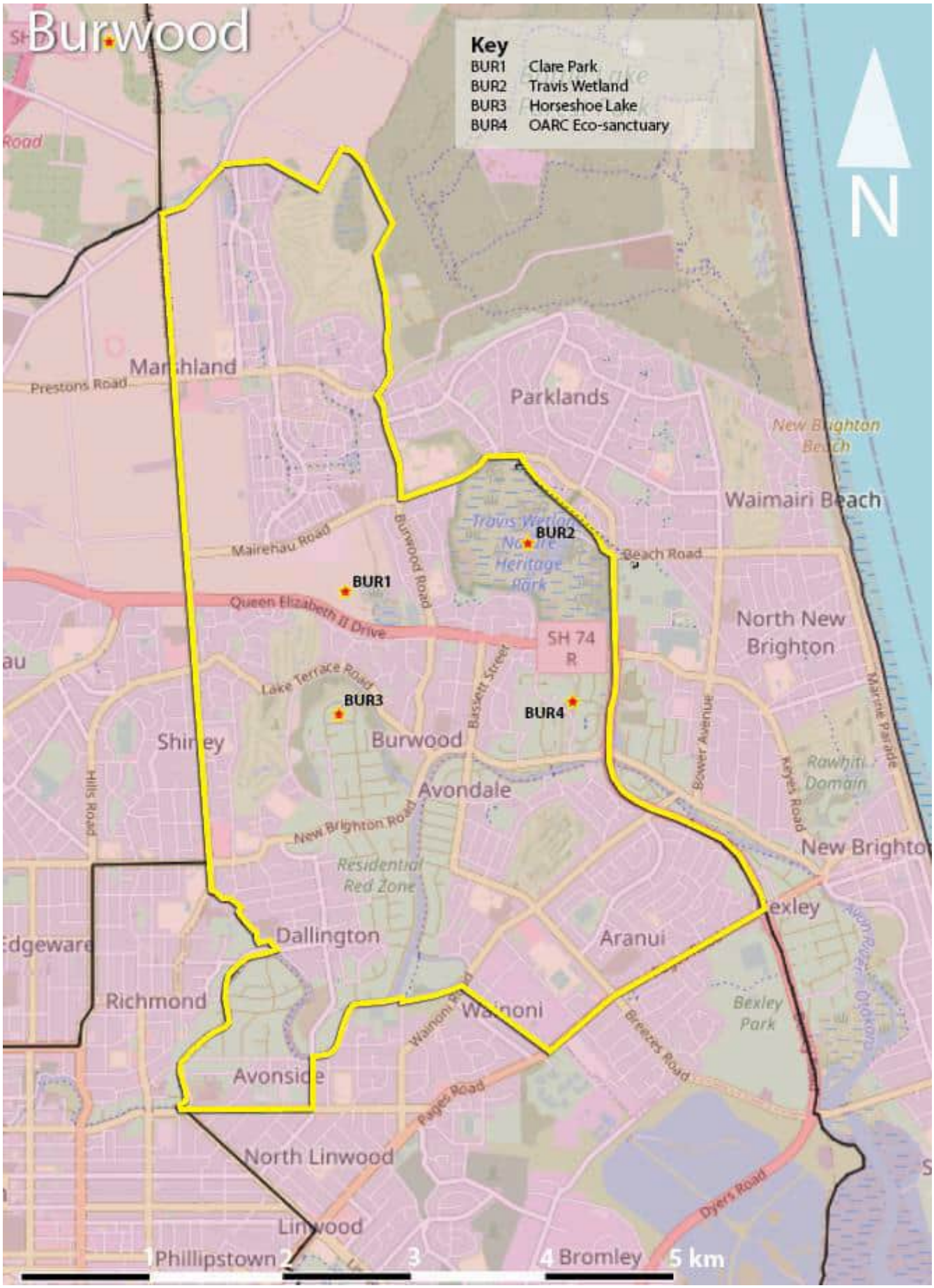
Coastal woodland, shrubland and wetland restoration has been underway at the 15-hectare area at the southern tip of South New Brighton spit for a number of decades. However, establishment has been slow due to the harsh coastal environment and arson, and as a result large areas are still dominated by marram grass.

There is an already known lizard population and lizard management plan for the site, and therefore the potential for this site to be used for further translocations will depend on the size of this population. However, the carrying capacity could be significantly increased through additional planting and increased predator control. While the area will be subjected to the effects of sea level rise, there will be scope for this population to retreat into slightly higher areas that are currently occupied by housing.

Item	Note
Prepare planting area (30,000 m2)[4]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[4] Quantities assume that only 3 ha of the wider 15 ha site is established as lizard habitat.

Burwood



Christchurch City Council

Clare Park (BUR1)

A large Regional Park immediately west of the Clare Park stormwater facility that is currently leased for horse grazing covers almost nine hectares. The area consists of a mix of former old dune and peat plain ecosystems, however there is currently no plan to develop this site.

However, the ecological restoration of this site would provide a significant extension to the natualised stormwater wetlands and would provide a strategically located forest patch in the city-wide forest patch configuration. Within this site there is also scope to establish significant habitat that would support lizard populations. There may also be potential to utilise islands within the stormwater wetland facility as lizard habitat, however this will need to be considered alongside the operational requirements of the wetland.

Item	Note
Prepare planting area (15,000 m2)[5]	Blanket spray of existing grass areas (two passes)
Supply 11,000 plants	Plants at (average) 1.2 m centres
Plant 11,000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Interpretation	
Manipulate wetland islands	Covers any habitat alteration to islands within stormwater wetland
TOTAL	

[5]Quantities assume that only 1.5 ha of the wider 9 ha site is established as lizard habitat.

Travis Wetland (BUR2)

Travis Wetland is a large Regional Park and a Schedule-A Site of Ecological Significance in the Christchurch District Plan. While the key values of the reserve are for its significant avifauna and botanical values, the area also supports significant freshwater aquatic values and may also have scope for supporting lizard populations around the drier margins - particularly along the Mairehau Road former old dune ecosystem.

Travis Watland also supports large areas of native forest restoration plantings, some of which that are now approaching thirty years old with closed canopies and prolific understorey regeneration. These areas may have potential to support the reintroduction of Waitaha gecko via a future salvage and translocation projects, increasing the overall ecological value of Travis Wetland. Restoration would be limited to enrichment plantings within existing planting areas, the provision of fine scale habitat features and increased predator control.

Item	Note
Prepare planting spots (2500)	Prepare individual locations at (average) 5 m centres throughout
Supply 2500 niche plants	Plants at (average) 5 m centres
Plant 2500 niche plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
Interpretation	
TOTAL	

Horseshoe Lake (BUR3)

Horseshoe Lake is another Regional Park and Schedule-A Site of Ecological Significance in the Christchurch District Plan. While it is a freshwater wetland ecosystem, a large area of former Residential Red Zone immediately to the south (within the 'horseshoe') has high restoration potential. This area is higher and drier than Horseshoe Lake and consists of highly modified anthropogenic fill material over lush older plains wet Taitapu soils.

This former Red Zone land was formerly proposed as a large stormwater wetland facility to treat stormwater from the extensive Dudley Creek Catchment before entering the Ōtākaro-Avon River. However, this stormwater facility is now proposed to be located elsewhere and instead the area will most likely be restored as natural wetland and other indigenous ecosystems. With careful planning, habitat suitable to support lizards could be incorporated into the design of the wider area.

Note: Council's Regional Parks Rangers are planning to plant the former landfill site on the western side of Horseshoe Lake with divaricating shrubs and other lizard friendly native plants.

Item	Note
Prepare planting area (10,000 m2)[6]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[6] Quantities assume that only 1 ha of the wider site is established as lizard habitat.

Otakaro Avon River Corridor – Eco-sanctuary (BUR4)

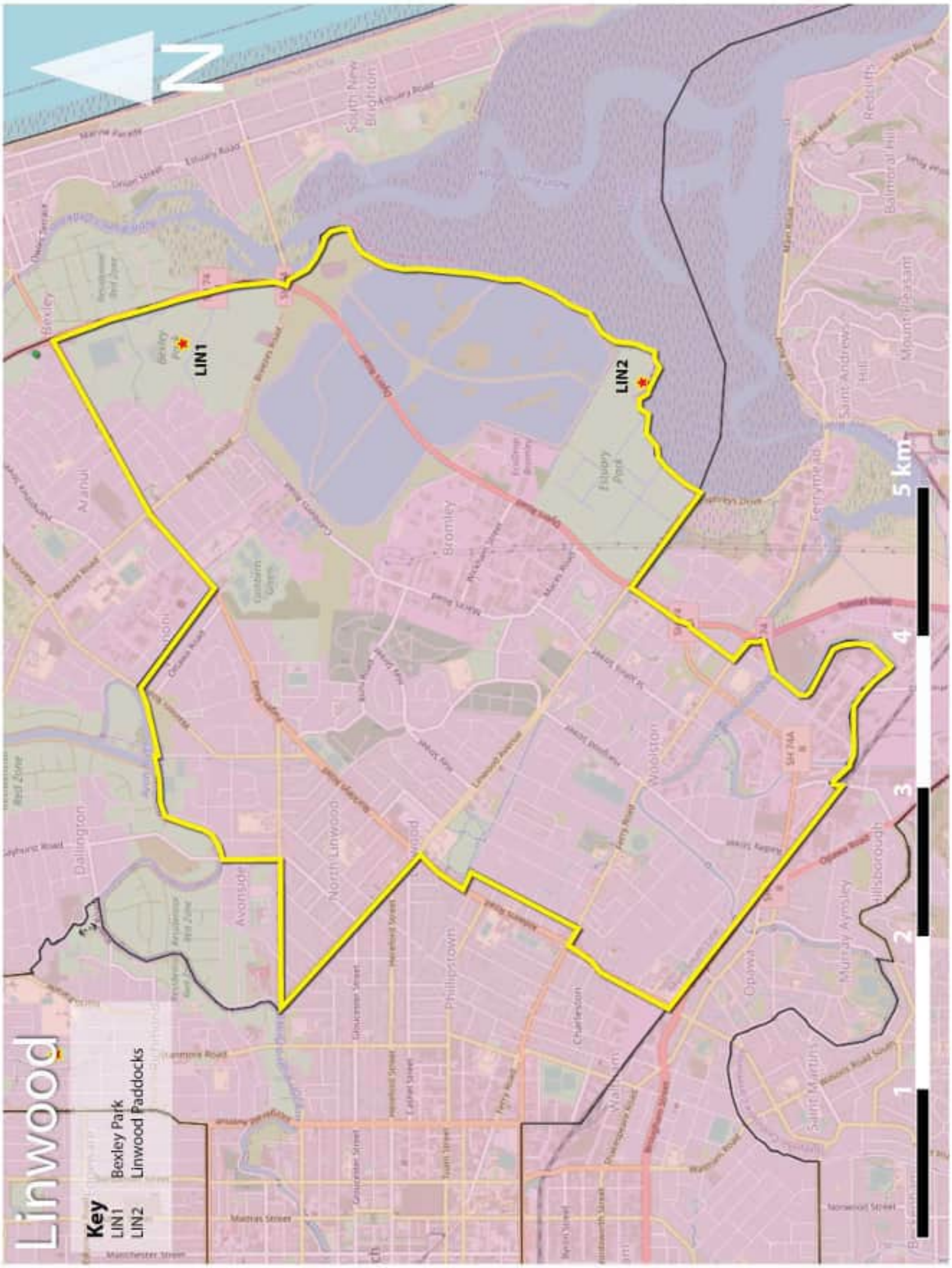
A third-party proposal for a large area of former residential red zone land between New Brighton Road and Travis Road sees the area developed as a predator proof fenced *'Eco-sanctuary.'* While the Waitakere Eco-sanctuary Trust do not yet have funding to commence this project, there is already a significant area of native forest and shrubland within the site, and Council are continuing with further restoration planting in the 2024 planting season.

Key objectives of the Eco-sanctuary initiative are to provide and protect habitat for vulnerable wildlife, to showcase to the public a wide range of our indigenous flora and fauna within the urban environment, and to provide education and eco-tourism opportunities. In doing so, the Waitakere Eco-sanctuary Trust hope to provide habitat for a wide range of species, which include lizards. Therefore, in collaboration with the Waitākiri Eco Sanctuary Trust, specific areas of habitat suitable for lizards could be planned immediately and restoration could be funded from within Council's existing Red Zone budgets.

Item	Note
Prepare planting area (20,000 m2)[7]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[7] Quantities assume that two hectares of the wider site is established as lizard habitat.

Linwood



Bexley Park (LIN1)

The former capped landfill site covers approximately 45 hectares and has been developed mostly as a recreation park, hosting activities such as BMX, a pump track and blow-carting. There have been small areas of native groundcover and shrub planting, including an existing small area near Bexley Road that has been developed by Councils Regional Parks team as lizard habitat. However, most of the site remains maintained as an open expansive mown or grazed grassland that has no confirmed future use.

Council's Park ecologist has observed lizards at this site, and therefore while it may not be possible to establish native forest on the capped landfill, it may lend itself well to improving existing habitat to support a larger and more robust lizard population. Alternatively, and not withstanding fire-risk considerations, if grazing were removed from selected areas, these would quickly revert to rank grass, thereby improving habitat. Importantly, optimal lizard habitat - being low in stature – would not impact on activities like blow-carting that require a good degree of wind.

Item	Note
Prepare planting area (10,000 m2)[8]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) <1.0 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[8] Quantities assume that one hectare of the wider site is established as lizard habitat.

Linwood Paddocks (LIN2)

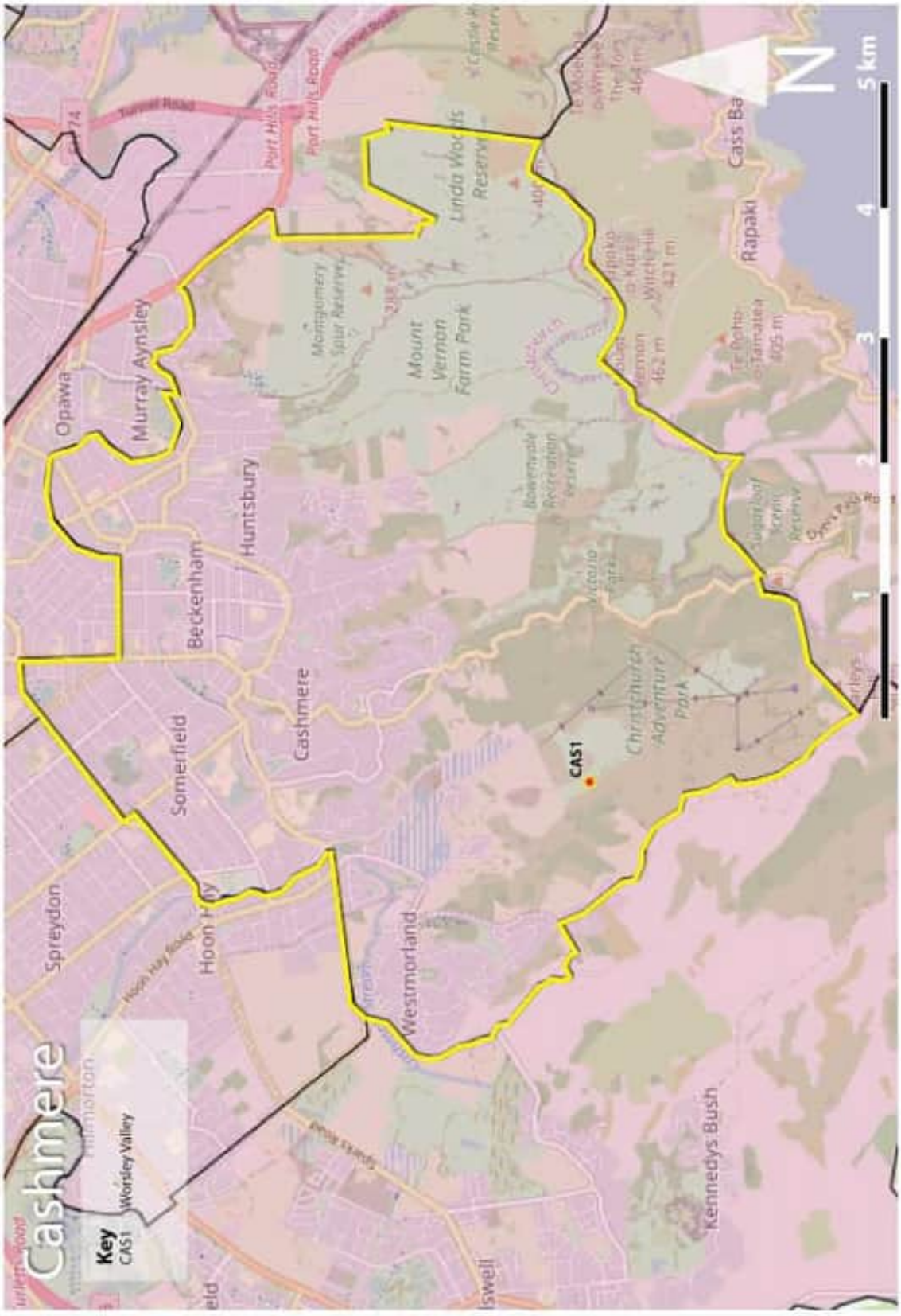
Council staff are currently working to prepare a landscape development plan for the Linwood Paddocks to better restore and manage coastal wetland and waterbird populations across the site. The site is a Schedule-A Site of Ecological Significance in the Christchurch District Plan and is contiguous with the Ihutai/Avon-Heathcote Estuary and the Bromley oxidation ponds wildlife sanctuary.

Although the primary value of this site will be for waterbird conservation and salt meadow expansion, there are high sandy areas - particularly along the north and northeast ends of the Linwood Paddocks where we plan to establish habitat that will support lizard populations. Of note, there is also an established lizard population along the eastern margin of the site. However, as areas are retired from grazing and revert to rank grass, and as the anticipated habitat restoration work is conducted, this is likely to significantly increase lizard habitat and carrying capacity at the Linwood Paddocks.

Item	Note
Prepare planting area (10,000 m2)[9]	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) <1.0 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

[9] Quantities assume that one hectare of the wider site is established as lizard habitat.

Cashmere



Christchurch City Council

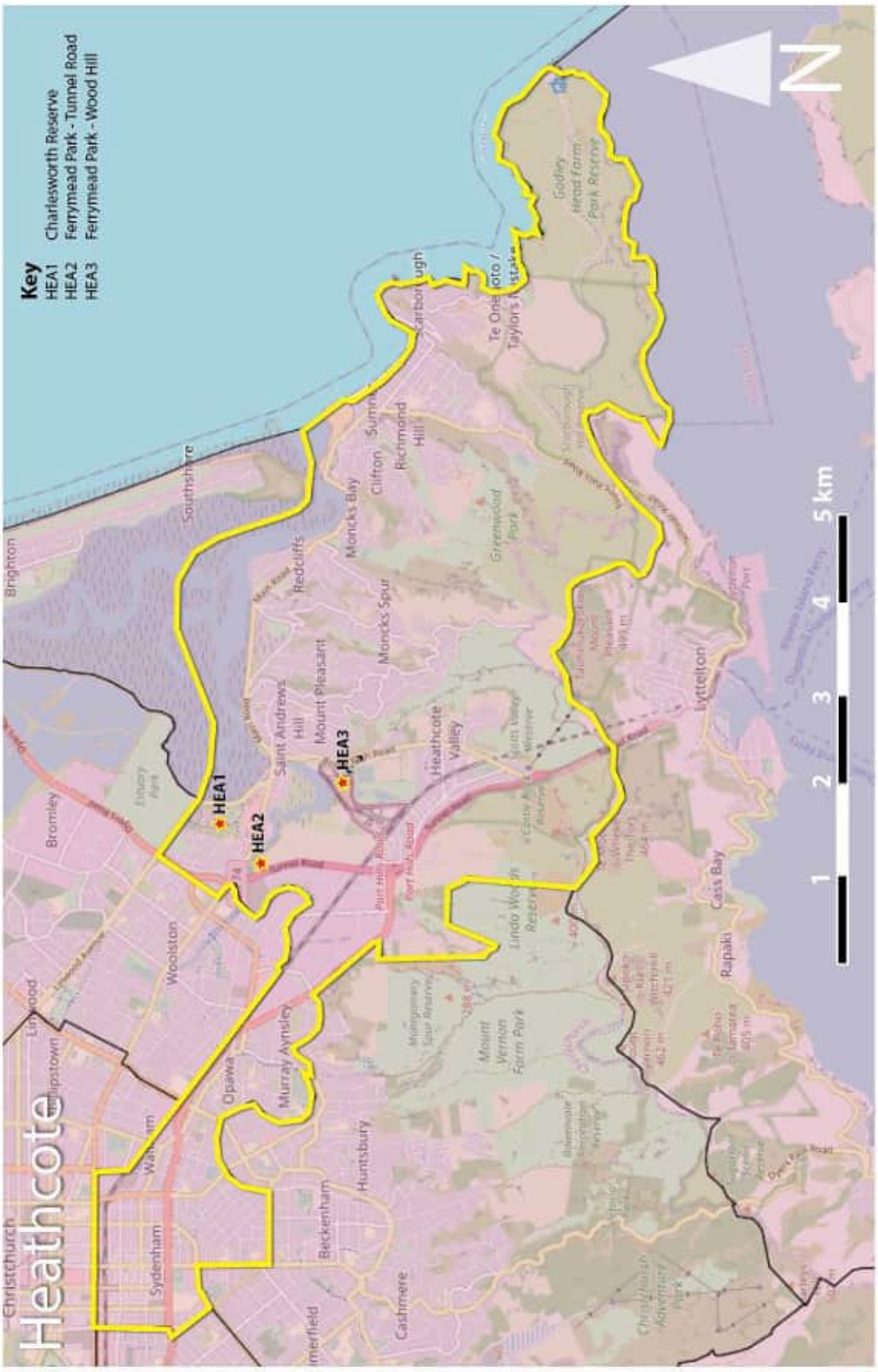
Worsley Valley (CAS1)

Following the 2017 Port Hills Fire, significant restoration work has taken place in Worsley Valley, and around the same time Council also acquired a significant parcel of land on the western face of Marleys Spur as part of an adjacent residential subdivision. Restored areas in the valley floor have been forest, riparian and wetland plantings, however the drier western face of Marleys Spur is likely to provide good lizard habitat once appropriate restoration is conducted. Although there will almost certainly be resident lizard populations at these sites, further habitat enhancement could significantly increase their carrying capacities. The new and undeveloped Regional Park land on the he western face of Marleys Spur covers around 6.5 hectares.

Item	Note
Prepare 7000 planting spots[10]	Spot spray individual planting locations
Supply 7000 plants	Plants at (average) <1.0 m centres
Plant 7000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
TOTAL	

[10] Quantities & rates reflect difficult terrain and allows for planting at (average) 3 m centres throughout the 6.5-hectare site.

Heathcote


Key
HEA1 Charlesworth Reserve
HEA2 Ferrymead Park - Tunnel Road
HEA3 Ferrymead Park - Wood Hill
HEA1
HEA2
HEA3
Heathcote
N
1
2
3
4
5 km
Christchurch
Sydenham
Beckenham
Huntsbury
Cashmere
Woolston
Opawa
Murray Aynsley
Bromley
Brighton
Southshore
Redcliffs
Monacks Bay
Clifton
Richmond Hill
Moncks Spur
Saint Andrews Hill
Mount Pleasant
Heathcote Valley
Lyttelton
Cass Bay
Rapaki
Godley Head Farm Park Reserve
Mount Vernon Park

Charlesworth Reserve (HEA1)

Charlesworth Reserve comprises a mosaic of Indigenous coastal vegetation communities that grade from mudflats and salt meadow through to maturing kahikatea forest. Within this reserve, no herbicide is used, and there is already a strong lizard population amongst the rank grasses and coastal shrubland.

Within the reserve there remains a further one-hectare of mown grass that offers potential to be restored as additional coastal habitat. Much of this area sits beneath overhead electrical transmission pylons and wires, and as-such cannot be planted with tall forest or woodland vegetation. However, this restriction lends itself well to the establishment of more coastal shrubland that could me managed to support a larger lizard population, and staff also feel that geckos could be considered for release into the existing mature plantings.

Item	Note
Prepare planting area (10,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 12,000 plants	Plants at (average) 1.0 m centres
Plant 12,000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Ferrymead Park – Tunnel Road (HEA2)

Downstream from Tunnel Road along the true right bank of the Ōpāwaho-Heathcote River are a number of areas that could be developed to support lizards. While there is already an existing lizard population along this site, these additional areas could easily be enhanced through targeted planting, predator control and through the inclusion of fine-scale habitat features to increase the overall carrying capacity of the site. Of note, there is an existing small area (approximately 500 m2) of lizard habitat that was planted by Royal Forest & Burd Protection Society around 2017 that could be expanded on.

Item	Note
Prepare planting area (5,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 5500 plants	Plants at (average) 1.0 m centres
Plant 5500 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

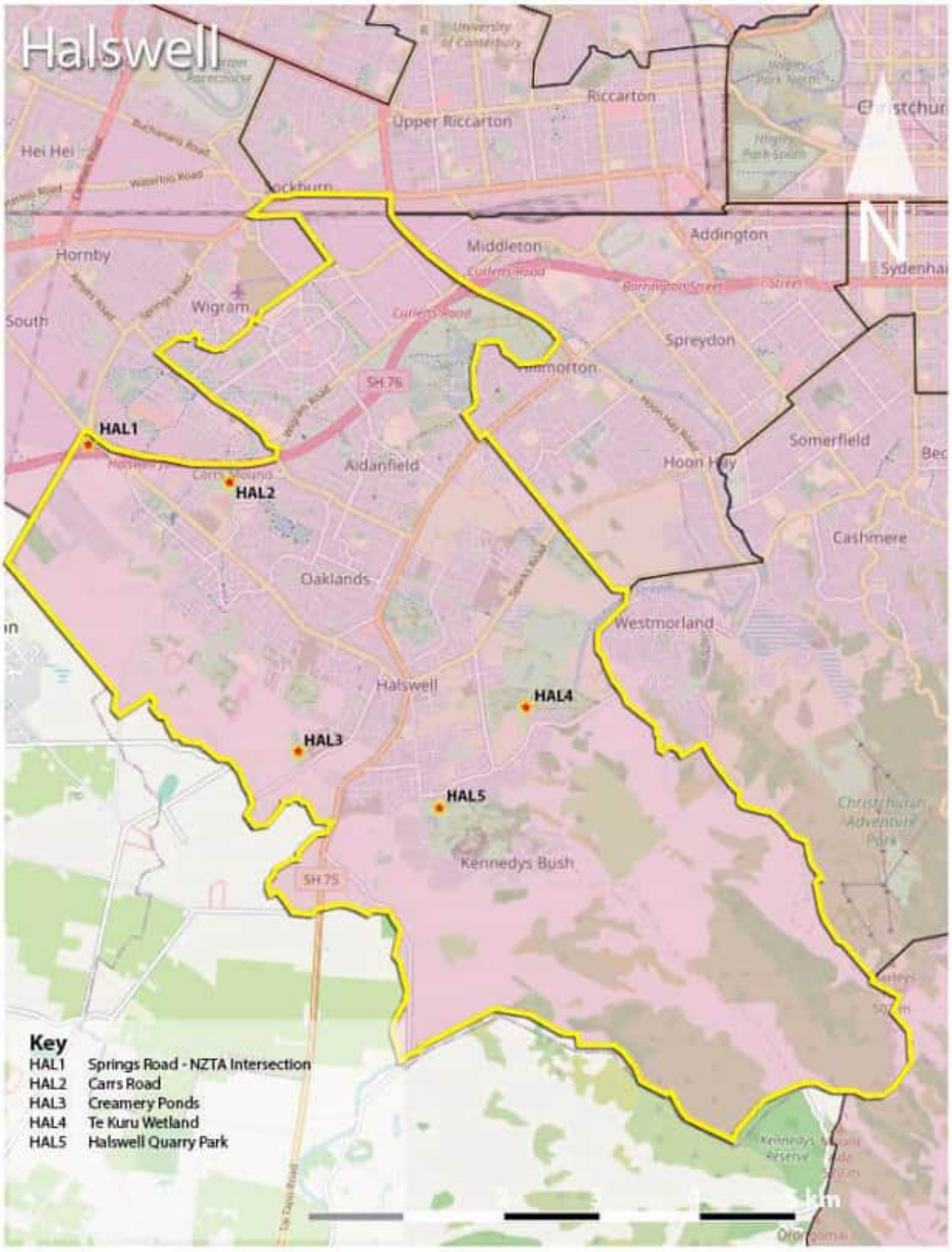
Ferrymead Park – Wood Hill (HEA3)

This former capped landfill that overlooks the mouth of the Ōpāwaho-Heathcote River is currently dominated by wide expanses of mown grass with scattered native coastal woodland. It is used for passive recreation, but also hosts some more active events such as Cyclo-X and an informal skateboarding area has been built on an existing concrete pad.

However, at four hectares, the area is large enough to accommodate recreation activities and a good degree of habitat restoration to complement the adjacent saltmarsh and salt meadow environments that make up the Schedule-A Site of Ecological Significance in the Christchurch District Plan. An approved landscape development plan for Ferrymead Park shows extensive native woodland and shrubland vegetation being established at the eastern end of Wood Hill, and this could be designed to support lizard translocations.

Item	Note
Prepare planting area (10,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Halswell


Halswell
Riccarton
Upper Riccarton
Hei Hei
Hornby
Wigram
South
Middleton
Addington
Spreydon
Sydenham
SH 76
HAL1
HAL2
Aidanfield
Somerfield
Cashmere
Oaklands
Westmorland
Halswell
HAL4
HAL3
HAL5
Kennedys Bush
SH 75
Key
HAL1 Springs Road - NZTA Intersection
HAL2 Carrs Road
HAL3 Creamery Ponds
HAL4 Te Kuru Wetland
HAL5 Halswell Quarry Park
N

Springs Road – NZTA Intersection (HAL1)

The entire three-hectare block of Waka Kotahi/NZTA land bounded by the intersections of Halswell Junction Road, Springs Road and the Christchurch Southern Motorway was originally planned to be established as lizard habitat to receive lizards translocated as part of the motorway construction. However, only 2400 m2 (8%) of the area has been fenced and planted as lizard habitat, as depicted by the hourglass shaped area in the aerial photograph below. Furthermore, NZTA contractors have continued to weed whack the area, and as a result the site is not meeting its required intention for lizard habitat.

A series of other planted patches within and along the edges of the large triangular block add an additional hectare of planting to the site. However, these plantings have been established more for amenity purposes than quality lizard habitat. Considering these existing planted areas, there remains significant potential to continue to work with NZTA to supplement these plantings with a further 1.70 hectares of habitat suitable for lizards and agree on a management prescription to create an undisturbed core lizard release area.

Item	Note
Prepare planting area (17,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 12,500 plants	Plants at (average) 1.2 m centres
Plant 12,500 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Carrs Road (HAL2)

At over ten hectares, the Carrs Road Reserve area is a significant area of open space in the Halswell area and adjoins the 7.40-hectare Carrs stormwater basin. The reserve area is a former landfill that has been capped and maintained as a rank grassland. Although appearing as a 'wasteland,' it has competing interests for its future development and use which may include continuing to host a go-kart club, provision of an artificial turf sports field, and the establishment of a strategically located urban forest patch as part of the city-wide native bush patch network.

However, due to the way this site has been managed for decades, Carrs Reserve already hosts a healthy lizard population, and any development will need to take this population into account by developing and implementing a lizard management plan. Alternatively, lizard-supporting habitat at the site could be enhanced by restoring dryland vegetation communities across the area, providing fine-scale habitat features and conducting predator control.

Item	Note
Prepare planting area (25,000 m2)	Blanket spray of existing grass areas (two passes)
Supply 18,000 plants	Plants at (average) 1.2 m centres
Plant 18,000 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Creamery Ponds (HAL5)

The Creamery Ponds is another Council stormwater facility that is also a Schedule-A Site of Ecological Significance in the Christchurch District Plan, mostly on account of its value to a representative assemblage of native waterbirds. However, much of the site is dominated by exotic rank grassland which may also host an existing lizard population. Furthermore, recent modifications to the ponds have included the requirement for a short section of predator proof fence to be built to protect wildlife values from cats on what was previously an inaccessible island.

Lizard habitat could be created or enhanced at the Creamery Ponds through converting areas of exotic grassland to an authentic mid-aged plains ecosystem shrubland and grassland complex and by enriching the existing lakeside and island plantings. However, as with the Springlands site discussed earlier, the operational management of the facility will need to be taken into account to ensure that either a) any lizard populations are not disturbed or displaced by future management operations at the facility, or b) that the presence of lizards does not impact on how the site needs to be managed. Proposals for lizard translocations will also need to consider any future expansion of the facility.

Item	Note
Prepare planting area (2500 m2)	Blanket spray of existing grass areas (two passes)
Supply 2900 plants	Plants at (average) 1.0 m centres
Plant 2900plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine-scale habitat features	Import logs, woody debris, and river stone
TOTAL	

Te Kuru Wetland (HAL6)

Te Kuru Wetland is Ōtautahi-Christchurch's largest stormwater management facility covering a vast array of waterways, natural wetlands, planted native forest and shrubland, and an extensive treatment train of constructed stormwater ponds and wetlands. Although the primary purpose of Te Kuru Wetland is for stormwater management, Council have adopted a six-values approach to its design and management, where the site is managed for its landscape, ecological, cultural, recreational and heritage values as well as its drainage values.

At the southern end of the site, a 0.75-hectare area has been set aside as a lizard management area to mitigate the loss of lizard habitat that occurred during the construction of the Te Kuru Wetland facility. Currently the area is dominated by expansive gravels, scattered boulders and large woody debris but has little in the way of planting that would support a healthy lizard population. However, with further refinement this area could be further enhanced through appropriate planting and predator control.

Item	Note
Prepare planting area (7500 m2)	Spot preparation for 3500 plants
Supply 3500 plants	Plants at (average) 1.5 m centres
Plant 3500 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	Import logs, woody debris, and river stone
TOTAL	

Halswell Quarry Park (HAL7)

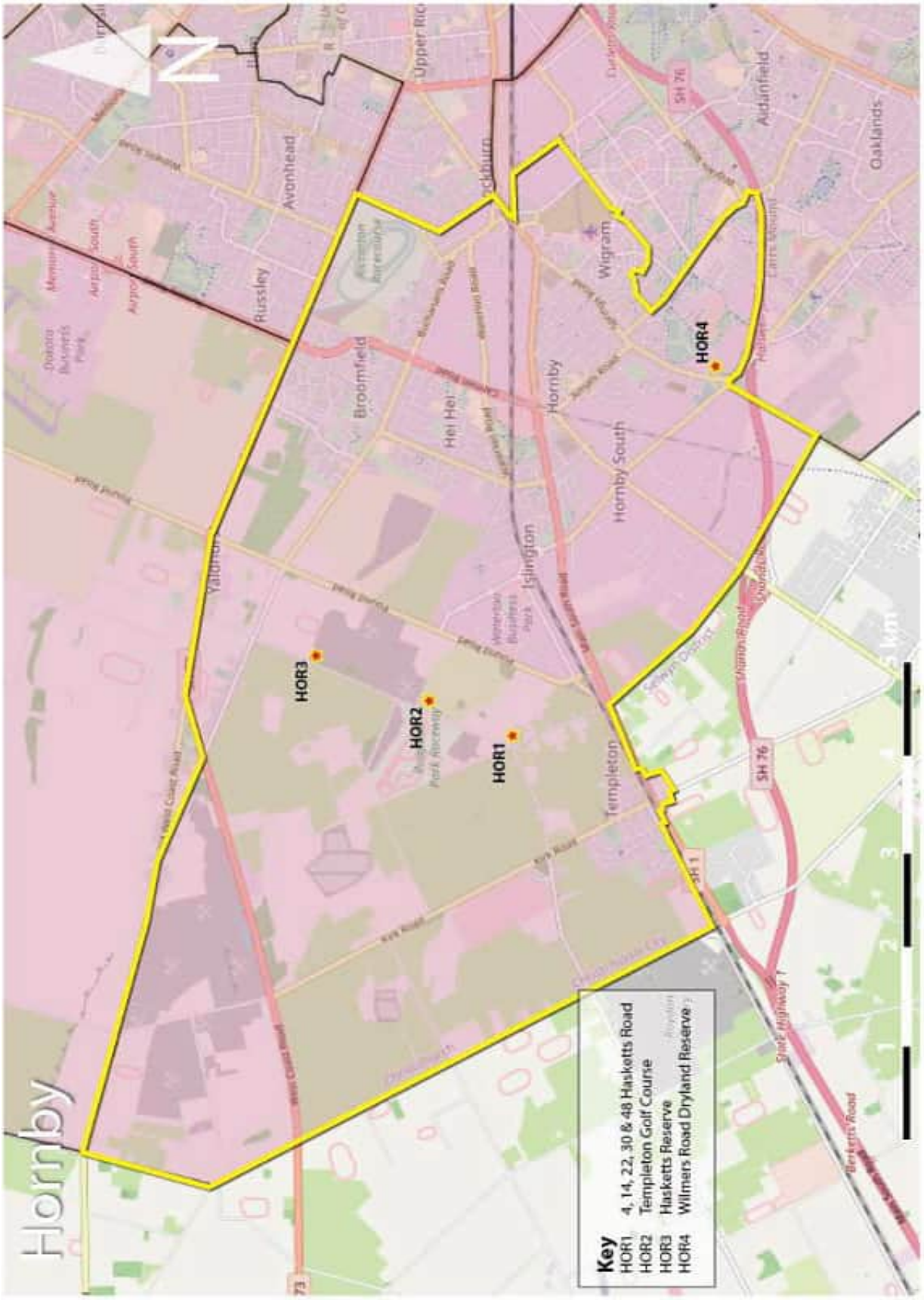
Halswell Quarry Park is a popular Regional Park at the base of the Port Hills that is centered around a former quarry and a series of sister city gardens. At the western end of the site, 4.5-hectares of native forest and wetland have been established, and while the approved plans for the park show the area being increased to ten hectares, this has not yet occurred.

If plans to achieve the originally intended forest area were implemented, habitat suitable for supporting lizard populations could be incorporated into this area. Also, there will be other areas throughout the park system, including the quarry site itself that would support lizards, and likely already do. The carrying capacity of these other areas could also be improved through targeted planting and enhanced predator control.

Item	Note
Prepare planting area (10,000 m2)[11]	Blanket spray of existing grass areas (two passes)
Supply7200 plants	Plants at (average) 1.2 m centres
Plant 7200 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	Import logs, woody debris, and river stone
TOTAL	

[11] Quantities assume that one hectare of the wider site is established as lizard habitat.

Hornby



Christchurch City Council

4, 14, 22, 30 and 48 Hasketts Road (HOR1)

Five of the six properties on Hasketts Road between Barters Road and the Templeton Golf Course have recently been acquired by Council, while the sixth property remains owned by Kainga Ora/Housing New Zealand. Combined, the Council owned properties cover more than ten hectares and adjoin the golf course which is a Schedule-A Site of Ecological Significance in the Christchurch District Plan on account of its significant albeit degraded botanical values.

While the final use of these newly acquired properties has not yet been determined, they are situated on young-to-mid aged plains ecosystem soils that would provide ideal substrates for establishing optimal lizard habitat. They therefore offer significant potential for ecological restoration and would make an important extension to the Templeton Golf Course Site of Ecological Significance.

Note: These properties are currently on Councils disposal list.

Item	Note
Prepare planting area (20,000 m2)[12]	Blanket spray of existing grass areas (two passes)
Supply 14,500 plants	Plants at (average) 1.2 m centres
Plant 14,500 plants	Contract planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
TOTAL	

[12] Quantities assume that two hectares of the wider site is established as lizard habitat.

Templeton Golf Course (HOR2)

Templeton Golf Course is owned by Christchuch City Council and leased to the Templeton Country Club Golf Club. It is a Schedule-A Site of Ecological Significance in the Christchurch District Plan on account of its significant albeit degraded botanical values, which include remnant South Island kowhai and herbaceous dryland species.

Despite much of the site being highly modified and heavily managed as a golf course, there are likely areas that would be well-suited to restoration of dryland plant communities on the young-to-mid aged plains ecosystem soils. These soils and plant communities would be ideal for establishing optimal lizard habitat, which could cover as much as five hectares within the site.

Item	Note
Prepare planting area (50,000 m2)[13]	Blanket spray of existing grass areas (two passes)
Supply 36,000 plants	Plants at (average) 1.2 m centres
Plant 36,000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine scale habitat features	
TOTAL	

[13] Quantities assume that five hectares of the wider site is established as lizard habitat.

Hasketts Reserve (HOR3)

As with the 4 – 48 Hasketts Road properties described above, Council also owns a 4.36-hectare block of bare land on young-to-mid aged plains ecosystem substrates further north on Hasketts Road. These soils provide ideal substrates for establishing optimal lizard habitat.

While the final use of this property has not yet been determined, it sits immediately adjacent to a large (84 hectare) Fulton Hogan quarry that is nearing the end of its life. The quarry also borders the Schedule-A Site of Ecological Significance Templeton Golf Course to the south. Therefore, there is significant value in considering the restoration of this property, the quarry, the golf course, and the five other Council properties further south on Hasketts Road as a single large-scale ecological unit for restoration.

Note: This property is currently on Councils disposal list.

Item	Note
Prepare planting area (40,000 m2)[14]	Blanket spray of existing grass areas (two passes)
Supply 17,000 plants	Plants at (average) 1.5 m centres
Plant 17,000 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Fine scale habitat features	
TOTAL	

[14] Quantities assume that four hectares of 4.36 site is restored.

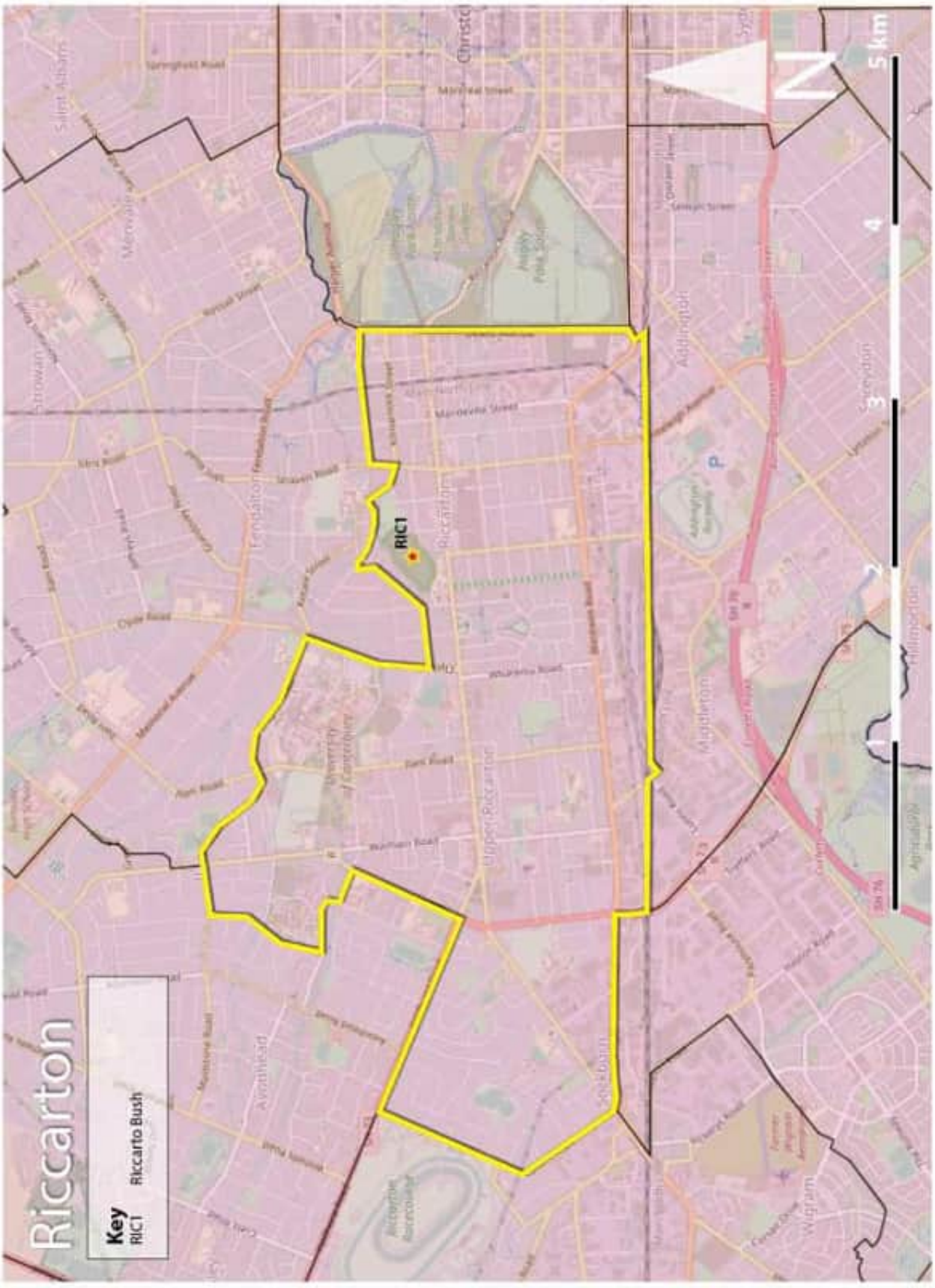
Wilmers Road Dryland Reserve (HOR4)

This small (1.5 hectare) reserve at the intersection of Wilmers Road, Springs Road and Halswell Junction Road is another Schedule-A Site of Ecological Significance in the Christchurch District Plan. Although small and degraded, it is one of the few remaining areas of dry plains ecosystem outside of McLeans Island.

Recently Parks Unit ecologists have prepared an ecological restoration plan for the site which includes restoration plantings that would support a translocated lizard population. Plant communities proposed for establishment include dry terrace grassland, river channel moss fields, dense kanuka/kowhai-dominated scrub and matagouri/mikimiki shrubland ecotones.

Item	Note
Prepare planting area (15,000 m2)	Preparation method to be determined
Supply 6500 plants	Plants at (average) 1.5 m centres
Plant 6500 plants	Contract and/or volunteer planting
Establishment (24 months)	Low level of maintenance to ensure plant survival & growth
Interpretation	
Fine scale habitat features	
TOTAL	

Riccarton

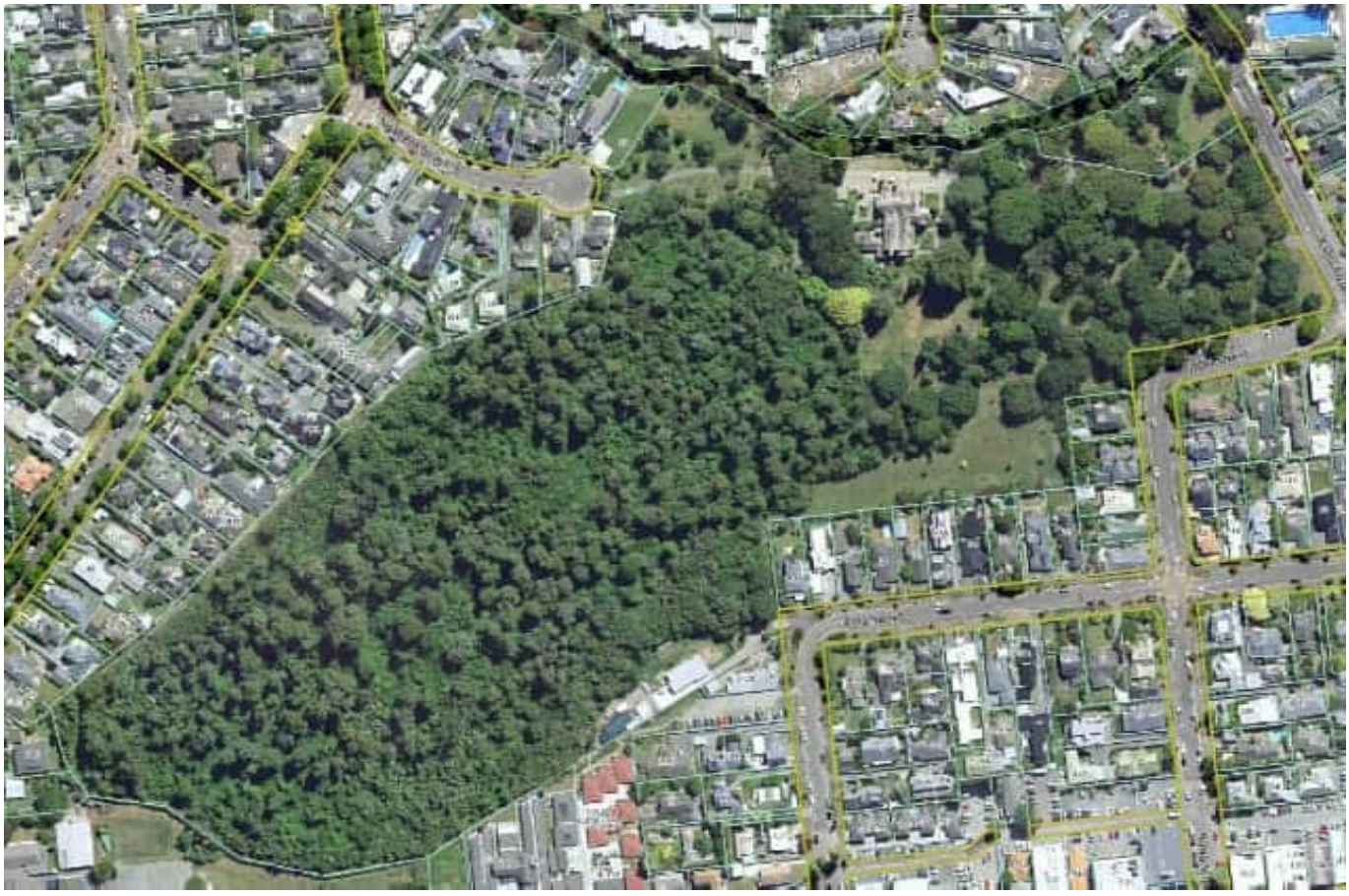


Christchurch City Council

Pūtagringamotu/Riccarton Bush (RIC1)

Pūtagringamotu/Riccarton Bush (7.8 hectares) is the only remaining natural forest on the Low Canterbury Plains. It is owned and administered by the Riccarton Bush Trust under its own act of parliament and has been completely enclosed in an exclude-all predator proof fence. Although unsuitable for skinks, there may be potential to release (e.g.) Waitaha geckos into this predator-free 600-year-old forest remnant.

In terms of its habitat quality, Pūtagringamotu/Riccarton Bush may be suitable for lizard release almost immediately with little habitat improvement required. However, Council staff will need to collaborate closely with representatives from the Riccarton Bush Trust to determine the feasibility of using this site, and what – if any – habitat improvements could be made to improve carrying capacity.



Item	Note
Interpretation	Consider including as part of wider bust enhancement programme
Other[15]	
TOTAL	

[15] Ecologists to determine what other actions could be considered to provide optimal lizard habitat at Pūtagringamotu-Riccarton Bush.

References

DoC (2019) *Key principles for lizard salvage and transfer in New Zealand.* Department of Conservation, Wellington, New Zealand.


Christchurch
City Council