# Ōtākaro Avon River Corridor (OARC)

# Delineation of natural inland wetlands in OARC

April 2025



Approvals panel						
Author	Nicholas Head Senior Ecologist Parks Planning & Asset Management, Parks Unit.	<b>Date</b> 19/03/2025	Signature			
Reviewed by	<b>Dr Antony Shadbolt</b> Team Leader – Biodiversity, Parks Planning & Asset Management, Parks Unit.	Date 16/04/2025	alland			

Cover photo: wetland area 21



Parks Biodiversity Team | Name of document

#### Contents

Executive summary	2
ntroduction	3
Ecological context	3
Assessment method and wetland delineation	4
Supporting assessments	7
Results	8
Summary of wetland areas present in the OARC	1
Wetland area 1	1
Wetland area 2	2
Wetland area 3	3
Wetland area 4	4
Wetland area 5	5
Wetland area 6	6
Wetland area 7	7
Wetland area 8 - Porrit Park Loop	8
Wetland area 9	9
Wetland area 10	
Wetland area 11	
Wetland area 12	
Wetland area 13	
Wetland area 14	14
Wetland area 15 – Goodman Street	
Wetland area 16	
Wetland area 17	
Wetland area 18	
Wetland area 19	
Wetland area 20	20
Wetland area 21	21
Wetland area 22	21
Wetland area 23	23
Wetland area 24 - Dallington Terrace	24
Wetland area 25	25
Wetland area 26 - Bexley	26
Wetland area 27	27

Wetland area 28	
Conclusion	29
References	

## **Executive summary**

A rapid botanical assessment of the Ōtākaro Avon River Corridor (OARC) red zone was conducted on February 24, 26, 27, and 4<sup>th</sup> April 2025, to identify natural inland wetlands and assess their ecological significance, including habitat values for birds and lizards.

Potential wetland areas were assessed for wetland vegetation based on species composition and abundance, with GPS coordinates recorded and photographs taken. Notable species and serious invasive weeds were also documented.

This assessment followed Ministry for the Environment (MfE) wetland delineation protocols. Some wetlands induced by human activity were considered where they had formed a recognisable community of wetland species, but small isolated clumps of wetland plants and thin strips along impervious road edges were generally excluded.

28 natural inland wetlands covering 33 ha in total were identified. Most comprised small depressions that had been colonised by mostly exotic facultative wetland species, with a few areas supporting native wetland plants like raupō, pūkio, and *Juncus* spp.

Mapping wetlands in the Waikākāriki/Horseshoe Oxbow area proved particularly difficult due to the presence of numerous small, diffuse patches of facultative wetland species like creeping bent and umbrella sedge. These were intermixed with exotic pasture species, making it unclear whether they constituted natural inland wetlands.

Five sites (8, 15, 21, 24 and 26) met criteria for ecological significance due primarily to their larger size, and for being remnant natural floodplains with an unimpeded connection to a significant natural wetland or waterways.

No wetlands were significant based solely on botanical composition, as most were dominated by weedy exotic species. Some small wetlands may expand over time but currently have negligible ecological value due to their isolation.

Site 26 (Bexley) provided habitats for multiple species of waterfowl that were present. Outside of Bexley, water boatmen (*Sigara* sp) were the only other wetland fauna recorded.

The most serious invasive weeds observed included canary grass, yellow flag iris, montbretia, and grey willow. These should be controlled as they pose a threat to the ecological integrity of wetland restoration proposed throughout the OARC.

# Introduction

A rapid botanical assessment was undertaken by this author of the red zone Ōtākaro Avon River Corridor (OARC) over 24, 26, 27<sup>th</sup> February, and 4<sup>th</sup> April 2025. The areas assessed for wetlands is shown in Figure 1, below.

The purpose of this assessment was to determine the presence of natural inland wetlands (here within also referred to as "wetlands"). Habitat values for birds and lizards were also briefly considered, and comments are also made of the ecological significance of the areas generally.



Figure 1: Map of areas of Ōtākaro Avon River Corridor covered by survey.

# **Ecological context**

The OARC occurs in the Low Plains Ecological District<sup>1</sup>, which corresponds with the Eastern South Island Plains Land Environments (N1.C2; N1.1a, I3,3a LENZ<sup>2</sup>) <sup>3</sup>. The N1.C2 and N1.1a LENZ are predicted to have supported extensive wetlands of predominately dense raupo (*Typha orientalis*), harakeke (*Phormium tenax*), and pukio (*Carex secta*). Kahikatea (*Dacrycarpus dacrydioides*) swamp forest associations occurred on the slightly drier soils<sup>4</sup>. The poorly drained saline soils of the I3.3a LENZ supported salt tolerant shrublands and rushlands, such

<sup>4</sup> Wilson, H. D. 1992. Banks Ecological Region. Survey report for the New Zealand Protected Natural Areas Programme, Survey Report No 21. Canterbury Conservancy, Department of Conservation, Christchurch, New Zealand.



<sup>&</sup>lt;sup>1</sup> McEwen, W. M. (editor) 1987. Ecological regions and districts of New Zealand, third revised edition (Sheets). New Zealand Biological Resources Centre Publication No 5. Department of Conservation, Wellington.

<sup>&</sup>lt;sup>2</sup> The I3.3a makes up a minor proportion and relates to the lower floodplain below Bridge Street that was affected by saline tidal inundation.

<sup>&</sup>lt;sup>3</sup> Leathwick, J. R.; Wilson, D.; Rutledge, D.; Wardle, P.; Morgan, F.; Johnston, K.; McLeod, M.; Kirkpatrick, R. 2003. Land Environments of New Zealand, Nga Taiao o Aotearoa. David Bateman Ltd, Auckland. 184 pp.

as saltmarsh ribbonwood (*Plagianthus divaricatus*), sea rush (*Juncus krausii* subsp. *austaliensis*), oioi (*Apodasmia similis*) etc.

With agricultural and urban development that has occurred since European settlement, almost all native vegetation has been removed from the Low Plains ED and respective LENZ. The exception being small remnants of common native wetland species that survived in drains and in localised wet areas.

The N1.C2; N1.1a, I3,3a LENZ are listed as acutely threatened<sup>5</sup>, meaning that over 90% of the original indigenous ecosystems these LENZ supported have been lost nationwide. Consistent with this, less than 10% of natural wetlands remain in lowland New Zealand generally.

The protection of New Zealand's remaining wetlands is a National Priority<sup>6</sup>. Furthermore, Policy 6 of the National Policy Statement for Freshwater Management (NPS-FWM)<sup>7</sup> requires councils: **"to ensure no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted**".

The Ōtākaro Avon River, Waikākāriki/Horseshoe Lake, and Cockayne Reserve are contiguous with the OARC. These areas are significant ecological sites (SES) in the District Plan for supporting representative indigenous biodiversity (flora and fauna). Waikākāriki and Cockayne Reserve, as well as the estuarine component of the lower Ōtākaro, are regionally significant wetlands because they are good examples of what remains of oxbow and riparian wetlands once a common across the district, and they are of the utmost importance for indigenous biodiversity.

# Assessment method and wetland delineation

Aerial photos and satellite imagery were viewed initially to determine the presence of potential wetlands. The entire area was then surveyed by bicycle for areas of wetland vegetation. When wetland species were obviously present the site was assessed for wetland species composition and abundance. A GPS location of each wetland area was recorded and photograph taken. Notes were also taken on wildlife, any notable species /features, troublesome weeds etc.

This wetland assessment was undertaken in accordance with the Ministry for the Environment (MfE) wetland delineation protocols<sup>8</sup>, including the pasture exclusion assessment methodology<sup>9</sup>, the New Zealand wetland plant list<sup>10</sup>, and the prevalence test<sup>11</sup> where necessary.



<sup>&</sup>lt;sup>5</sup> Walker, S.; Cieraad, E.; Barringer, J. 2015. The Threatened Environment Classification for New Zealand 2012: a guide for users. Landcare Research, 27 p. Landcare Research New Zealand ltd, Dunedin.

<sup>&</sup>lt;sup>6</sup> Protecting our places: Introducing the national priorities for protecting rare and threatened biodiversity on private land. Available at <u>https://www.biodiversity.govt.nz/land/guidance/</u>

<sup>&</sup>lt;sup>7</sup>https://environment.govt.nz/publications/fresh-water/national-policy-statement-freshwater-management-2020/.

<sup>&</sup>lt;sup>8</sup>Wetland delineation protocols | Ministry for the Environment

<sup>&</sup>lt;sup>9</sup> Pasture-exclusion-assessment-methodology.pdf

<sup>&</sup>lt;sup>10</sup> Clarkson, B. R.; Fitzgerald, N. B.; Champion, P. D.; Forester, J.; Rance, B. D. 2021. New Zealand Wetland Plant List 2021. Contract Report: LC3975. Manaaki Whenua -Landcare Research, Hamilton, New Zealand.

<sup>&</sup>lt;sup>11</sup> The Prevalence Index (PI) is a plot-based algorithm used to determine whether vegetation is hydrophytic (wetland). It's derived from the unique combination of OBL (Obligate Wetland), FACW (Facultative Wetland), FAC (Facultative), FACU (Facultative upland) and UPL (Upland). The PI is calculated as a weighted-average wetland indicator status of all (or nearly all) species in the sample, by assigning the following values to wetland indicator statuses: OBL: 1; FACW: 2; FAC: 3; FACU: 4; UPL: 5. Weight the indicator status by percent cover. If the resulting PI is≤ 3.0, the vegetation is considered hydrophytic (wetland). Values around 3.0 should be used alongside other wetland indicators.

Natural inland wetland is defined in the Resource Management Act (RMA) as "Permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions". The definition of 'natural wetlands' applies regardless of size and wetland condition (i.e., includes degraded wetlands), nor the presence of native species.

The NPS-FWM uses the RMA definition of 'wetland<sup>12</sup>, but provides for three exclusions, being:

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

Further guidance provided on examples on wetlands induced from human activity<sup>13</sup> includes:

- ✓ A wetland induced through an overflowing culvert
- A wetland induced as an unintentional result of forestry
- Remnant wetland habitats, e.g., those associated with drainage channels and other works installed to drain a natural wetland
- ✓ Wetland induced through stock pugging
- ✓ Wetland induced through roading works

#### Qualifiers

This assessment identifies wetlands as areas where a distinct and contiguous 'natural community' of wetland vegetation is present. While many small, isolated clumps of wetland species occur throughout the OARC, often in the absence of obvious surface water, these were not mapped. These small patches, typically occupying less than  $2m^2$ , were considered by this author not to meet the definition of natural inland wetlands, because they were either remnants of past gardens or comprised opportunistic weedy species that lacked the characteristics of a "community of wetland vegetation" (Fig 2).

Impervious road edges and footpaths have also been colonised by opportunistic exotic wetland species, most commonly exotic umbrella sedge (*Cyperus eragrostis*), which tend to form narrow strips (Fig 2). Most of these areas were not mapped as they were considered to meet the exemption criteria for 'artificial' wetlands. However, exceptions were made for roadside sites where wetland vegetation had formed a distinct wetland plant community and had extended into adjacent red-zone land.



<sup>&</sup>lt;sup>12</sup>Defined as "Wetland includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions".
<sup>13</sup> <u>https://www.wetlandtrust.org.nz/wp-content/uploads/2021/10/Defining-natural-wetlands-and-natural-inland-wetlands.pdf</u>

<sup>25/0538080 |</sup> Page 5

Parks Biodiversity Team | OARC Wetland Delineation



Figure 2: Left - small patches of 'adventive' rushes (adjoining old garden plantings) typical of those throughout the OARC. Right - induced wetland vegetation colonising road edges. Where examples of these occur in the OARC they have been excluded as wetlands in this assessment.

Mapping the extent of natural inland wetlands in the Waikākāriki/Horseshoe Oxbow area was particularly challenging. This area consists of numerous small, diffuse patches of facultative wetland species, predominantly creeping bent and umbrella sedge, interspersed among rank exotic 'pasture' species. While these wetland species may expand and eventually form a more cohesive wetland community over time, at the time of this assessment, most of the area could not be reasonably classified as natural inland wetlands, nor could the many small discrete wetland areas be accurately delineated. The Bexley wetland was similarly complex, however, the greater extent and dominance of predominately creeping bent (a facultative wetland species) meant much of the Bexley area (Site 26) was mapped as natural inland wetland vegetation.

Throughout this report the words "*seral (exotic) wetland vegetation*" (or similar) are used as a generic description of typical wetland vegetation; "*seral*" referring to the adventive/weedy and temporary nature of the composition. This is done to not repeatedly list the same species that predominately comprise the same composition that is common to these wetlands. Although the combinations of these common species vary in any one wetland, collectively they occur in proportions that meets the definition of a natural inland wetland

Species Scientific name	Common name	Species designation	
Agrostis stolonifera	Creeping bent	Facultative wetland	
Alopecurus geniculatus	Fox tail	Facultative wetland	
Cyperus eragrostis	Umbrella sedge	Facultative wetland	
Erythranthe guttata	Monkey musk	Obligate	
Holcus lanatus	Yorkshire fog	Facultative (pasture)	
Juncus articulatus	Jointed rush	Facultative wetland	
Juncus effusus	Soft rush	Facultative wetland	
Juncus pallidus (native)	Giant rush	Facultative wetland	
Juncus sarophorus (native)	Rush	Facultative wetland	
Ranunculus repens	Creeping buttercup	Facultative	
Salix cinerea	Grey willow	Facultative wetland	
Symphyotrichum subulatum	Sea aster	Facultative	

Table 1: list of species that typically comprise "seral" wetland vegetation" used as a generic description in this report.



#### Supporting assessments

This assessment is supported by previous ecological studies that has identified wetland vegetation within or adjacent to the OARC corridor, including:

- Waikākāriki Horseshoe Lake Restoration Options with Stormwater Development (Record 22/1000659), which provides information on the ecological values of Waikākāriki.
- Avon River Riparian Vegetation Survey, available at the <u>CCC GIS Portal<sup>14</sup></u> (Figure 3).
- Extent of Natural Inland Wetlands Adjoining ANZAC Drive, detailing wetland extent in the area, accessible at the <u>CCC GIS Portal</u><sup>15</sup> (Figure 4). This area is subject to a separate consent for which considerable ecological assessment work was undertaken<sup>16</sup>.



Figure 3: Map showing scope of Ōtākaro-Avon River Riparian Vegetation Survey

- <sup>15</sup> https://gis.ccc.govt.nz/portal/home/item.html?id=2874ce3bbf6544099abe9e845d418054
- <sup>16</sup> Record 25/469128: Ecological impact of proposed removal of road surfaces ANZAC Drive OARC wetland assessment



<sup>&</sup>lt;sup>14</sup> https://gis.ccc.govt.nz/portal/home/item.html?id=f0ad4e8fa2354e21b7aa3f256226c48



Figure 4: Map showing scope of natural inland wetlands adjoining ANZAC Drive.

# Results

A total of 28 sites were identified as meeting the definition of a natural inland wetland (Table 1). Most were small depressions of negligible ecological significance, primarily colonised by seral exotic species. Vegetation was typically a mosaic of "facultative wetland" species interspersed with non-wetland (facultative/upland/pasture) species. Sites with standing water supported a higher proportion of obligate wetland species.

These sites are shown in figures 5 to 8 below, and are mapped in the GIS portal titled "OARC Natural Inland Wetlands": https://gis.ccc.govt.nz/portal/home/item.html?id=241d6b518e424748bccc81704908c89b

Only a few sites contained native wetland plant communities that had not been planted, with raupō (*Typha orientalis*), pūkio (*Carex secta*), and *Juncus* spp. being the most common. The most widespread native species was *Juncus sarophorus*, which had naturally colonised multiple sites. At least three sites (8, 15, and 24) had supplementary planting of native wetland species.

Five sites (8, 15, 21, 24, 26) met criteria for ecological significance, based on their ecological context, rather than botanical composition. These sites, being 4.2ha, 4.5ha, 0.2ha, 1.4ha, 28ha respectively, are located on remnant floodplains adjoining significant wetlands or waterways. Given that floodplains are rare within the OARC, these sites present important opportunities for ecological restoration and the enhancement of OARC floodplain ecologies.



The remaining 23 sites were too small and lacked any notable features to have ecological values, though some may expand over time as wetland vegetation spreads. Neither collectively do these small wetlands have any ecological value, as they are widely spaced and isolated from existing wetlands and waterways.

No wetlands were considered ecologically significant based on botanical composition alone, as most were dominated by exotic species. However, several native species present at Sites 5, 6, and 27 have curiosity value, though not necessarily ecological value.

Site 26 (Bexley) provided habitats for multiple species of waterfowl that were present. Footprints in soft substrates were also seen at several other sites suggests temporary usage by most likely pukekos. Water boatmen were the only other wetland fauna recorded at Site 4<sup>17</sup>. No lizards were seen, although it is likely that they are present at sites that have been left to revert into rank vegetation, especially the larger sites such as Goodman Street (Site 15). The presence of lizards should be subject to further survey effort.

#### **Serious Invasive Weeds**

Although the wetlands assessed predominantly contain exotic and weedy species generally, the following invasive weed species were noted.

- Canary grass (Phalaris arundinacea)
- Grey willow (Salix cinerea)
- Montbretia (Crocosmia × crocosmiiflora)
- Yellow flag iris (Iris pseudacorus)

These species are particularly aggressive competitors. They have the potential to outcompete native wetland vegetation, alter hydrological conditions, and impede ecological restoration efforts. As such, active management should be undertaken to mitigate their impacts as they are a major threat to wetland integrity and proposed wetland restoration efforts within the OARC.

In addition to those listed above, several other serious weeds are present along the OARC that are likely to become very widespread in the absence of management. These include great willow herb (*Epilobium hirsutum*), purple loose strife (*Lythrum salicaria*), beggars tick (*Bidens frondosa*), Himalayan balsum (*Impatiens glandulifera*), water plantain (*Alisma aquatica*), pampas grass (*Cortaderia* spp), giant rhubarb (*Gunnera tinctoria*) among others. Great willow herb is declared an unwanted organism and purple loose strife a pest plant, and as such are subject to statutory/mandatory control. The presence of these species along the Ōtākaro Avon River are located in <u>CCC GIS Portal Avon River Riparian Vegetation Survey</u> (Figure 3).

<sup>17</sup> It is possible they were backswimmers (*Anisops* sp) instead of water boatman



Parks Biodiversity Team | Name of document



Figure 5: Natural inland wetlands surveyed within the Ōtākaro-Avon River Corridor. Blue shaded areas are ecologically significant wetland areas.

**Commented [SM1]:** Could we please have the ones of meet the criteria of ecological significant please be in a different colour?

Parks Biodiversity Team | OARC Wetland Delineation

Figure 6: Natural inland wetlands in the Dallington Loop reach of the Ōtākaro Avon River Corridor. Blue shaded area is an ecologically significant wetland area.



Parks Biodiversity Team | Name of document



*Figure 7:* Natural inland wetlands in the Porrit Park loop reach of the Ōtākaro Avon River Corridor. Blue shaded area is an ecologically significant wetland area.

Parks Biodiversity Team | Name of document



Figure 8: Natural inland wetlands surveys in the Horseshoe Lake reach of the Ōtākaro Avon River Corridor. Blue shaded area is an ecologically significant wetland.

26 25 Cockayne Reserve

Parks Biodiversity Team | OARC Wetland Delineation

Figure 9: Natural inland wetlands surveys in the Bexley reach of the Ōtākaro Avon River Corridor. Blue shaded area is an ecologically significant wetland.



Parks Biodiversity Team | Name of document

Wetland number	Informal name	Area	Latitude	Longitude
1		250 m <sup>2</sup>	-43.519002	172.665836
2		300 m <sup>2</sup>	-43.520669	172.665627
3		300 m <sup>2</sup>	-43.521155	172.666339
4		320 m <sup>2</sup>	-43.516061	172.671339
5		130 m <sup>2</sup>	-43.514716	172.669225
6		925 m <sup>2</sup>	-43.515372	172.667451
7		520 m <sup>2</sup>	-43.515411	172.666773
8	Porrit Park Loop Wetland	4.2 ha	-43.515303	172.684551
9		6200 m <sup>2</sup>	-43.514219	172.68315
10		100 m <sup>2</sup>	-43.517735	172.68242
11		100 m <sup>2</sup>	-43.520749	172.670436
12		350 m <sup>2</sup>	-43.508828	172.684038
13		1650 m <sup>2</sup>	-43.503571	172.683813
14		3700 m <sup>2</sup>	-43.507575	172.719478
15	Goodman Street Wetland	4.5 ha	-43.503239	172.681056
16		285 m <sup>2</sup>	-43.502213	172.678006
17		1600 m <sup>2</sup>	-43.501236	172.67885
18		480 m <sup>2</sup>	-43.500657	172.676965
19		2050 m <sup>2</sup>	-43.499516	172.674462
20		550 m <sup>2</sup>	-43.50119	172.674641
21		1800 m <sup>2</sup>	-43.503213	172.673902
22		115 m <sup>2</sup>	-43.502912	172.674754
23		170 m <sup>2</sup>	-43.502682	172.67616
24	Dallington Terrace	1.3 ha	-43.519441	172.670825
25		1100 m2	-43.312859	172.43645
26	Bexley wetland complex	20 ha	- 43.304659	172.431340
27		5500 m2	-43.30647	172.421225
28		200 m2	-43.30496	172.412193
TOTAL		33 ha		

Table 2: List, location and area of 24 wetlands surveyed within the Ōtākaro Avon River Corridor (OARC), with the four that meet criteria for ecological significance highlighted in green.

# Summary of wetland areas present in the OARC

#### Wetland area 1

Area: 250m<sup>2</sup>

Small spring and 'pond' with monkey musk (*Erythranthe guttata*) dense around edges. Surrounded by predominately exotic 'wetland' species composition dominated by umbrella sedge (*Cyperus eragrostis*), creeping bent (*Agrostis stolonifera*) that comprise greater than 50% cover, with jointed rush (*Juncus articulatus*), willow weed (*Polygonum* sp) and scattered plants of the native rush *Juncus sarophorus*. Surrounded by exotic trees from past residential gardens. Multiple facultative (semi) wetland and non-wetland (upland) herbs and



grasses forming a mosaic, including creeping buttercup (*Ranunculus repens*), Yorkshire fog (*Holcus lanatus*), dock (*Rumex obtusatum*), sea aster (*Aster subulosa*), clovers (*Trifolium repens; T. pratense*), cocksfoot (*Dactylus glomeratus*) etc.



25/0538080 | Page 1

#### Wetland area 2

#### Area: 300m<sup>2</sup>

Seral wetland vegetation in small depression dominated by creeping bent, with patches of umbrella sedge, jointed rush, orange foxtail (*Alopercurus aequalis*). Small patches of the native silverweed (*Argentina anserinoides*) somewhat unexpected. Seedling umbrella sedge common throughout wider non-wetland vegetation dominated by white clover.





25/0538080 | Page 2

#### Wetland area 3

#### Area: 300m<sup>2</sup>

Semi wetland vegetation but core area meets wetland definition as it is dominated by creeping bent and umbrella sedge. Otherwise, merging diffusely with exotic 'pasture' species with seedling umbrella sedge common throughout wider area.





25/0538080 | Page 3

### Wetland area 4

#### Area: 320m<sup>2</sup>

Edge of road and footpath, standing water and seral wetland vegetation except for clumps of native rush (Juncus sarophorus). Plentiful water boatman (Sigara sp)<sup>18</sup> in 'puddle'. Wetland vegetation extends along road edge as narrow strip owing to the impervious surface.



<sup>18</sup> It is possible they were backswimmers (*Anisops* sp) instead of water boatman

25/0538080 | Page 4

Christchurch City Council

## Wetland area 5

Area: 130m<sup>2</sup>

Small area of wetland and water ponding, seral exotic wetland vegetation with scattered *Juncus sarophorus*, similar to Area 4.





25/0538080 | Page 5

#### Wetland area 6

#### Area: 925m<sup>2</sup>

Fenced wet area dominated by native rushland (*Juncus sarophorus, Juncus pallidus*), with other common native wetland species including pukio (*Carex secta*), raupo (*Typha orientalis*), clubrush (*Isolepis distigmatosa*), and ubiquitous seral exotic herbs of umbrella sedge, monkey musk, creeping buttercup, aster, grey willow, Yorkshire fog, tall fescue etc. The presence of several native wetland species is an ecological curiosity if not significant.





25/0538080 | Page 6

Christchurch City Council

## Wetland area 7

Area: 520m<sup>2</sup>

Wet area fenced, rushland and seral wetland species. Montbretia (*Crocosmia X crocosmiiflora*) present, which is a highly invasive emerging weed that has the potential to seriously degrade wetland ecosystems.





25/0538080 | Page 7

### Wetland area 8 - Porrit Park Loop

Area: 4.2 ha

Natural floodplain, largely seral exotic wetland vegetation in mosaic with non-wetland spp. Creeping bent is the dominant species with large patches native sedge *Carex geminata*, rushes (*Juncus* spp), and planted pukio that merges into 'seral pasture'. Yellow flag iris (*Iris pseudacorus*) is common as are patches of canary grass (*Phalaris arundinacea*), both serious weeds that threatened the integrity and ecological potential of wetland restoration planned throughout the OARC. The uninterrupted connection of the 'wetland' area with the stream, its considerable size and the extensive patches of naturally occurring native wetland species means this area takes on some ecological significance.





25/0538080 | Page 8

## Wetland area 9

#### Area: 0.62 ha

Seral wetland vegetation dominant creeping bent. With scattered *Juncus sarophorus*, umbrella sedge, creeping buttercup common. Merging into rank 'pasture' with umbrella sedge seedlings common throughout. Surrounded by old garden trees.





25/0538080 | Page 9

## Wetland area 10

#### Area: 100 m<sup>2</sup>

Scrappy small area of seral wetland vegetation dominated by creeping bent and umbrella sedge. Similar smaller areas nearby associated with old boundary plantings not mapped.



**Commented [SM2]:** While I find this pretty funny, perhaps worth using 'scrappy'?!



25/0538080 | Page 10

## Wetland area 11

#### Area: 100 m<sup>2</sup>

Road edge wetland vegetation against bund. Patches of raupo and *Juncus sarophorus*, with typical seral 'pasture' mix. Should be excluded as wetland being clearly induced by the road and bund. Recorded only because of present of native wetland species.





25/0538080 | Page 11

## Wetland area 12

#### Area: 350 m<sup>2</sup>

Small area of marginally wetland vegetation dominated by creeping bent, including 3 clumps of common native rush (Juncus edgariae).



25/0538080 | Page 12

## Wetland area 13

Area: 1650 m<sup>2</sup>

Pond dominated by monkey musk surrounded by seral exotic wetland mix, including raupo, grey and crack willows.





25/0538080 | Page 13

## Wetland area 14

#### Area: 0.37 ha

Saline turf dominated by buck's horn plantain (*Plantago coronopus*), with other salt tolerant native species sparsely present, including glass wort (*Salicornia quinqueflora*) and salt grass (*Puccinellia stricta*). Probably maintained by mowing.





25/0538080 | Page 14

## Wetland area 15 - Goodman Street

Area: 4.5 ha

Mosaic seral wetland vegetation among exotic nonwetland vegetation. Hard to delineate owing to diversity of species both wetland and non-wetland. Planted areas included. This area has current consent for wetland restoration. Adjoins Waikākāriki/Horseshoe Lake, its large size, and native fish present in the stream means this site has ecological significance.





25/0538080 | Page 15

Christchurch City Council

## Wetland area 16

Area: 285 m<sup>2</sup>

Small depression dominated by creeping bent that is marginally wetland vegetation. Many similar small areas of 'semi-wetland' vegetation throughout generally.





25/0538080 | Page 16

## Wetland area 17

#### Area: 1600 m<sup>2</sup>

Roadside rushland and seral exotic wetland vegetation. Montbretia present along reserve boundary. Patches of creeping bent common among wider general exotic pasture composition.





25/0538080 | Page 17

### Wetland area 18

#### Area: 480 m<sup>2</sup>

Small depression, cover dominated by creeping bent with scattered rushes and typical seral mix. Marginally wetland vegetation, clearly induced through impervious road surfaces.





25/0538080 | Page 18

## Wetland area 19

Area: 2050 m<sup>2</sup>

Small depression dominated by creeping bent with scattered rushes and typical seral exotic mix. Marginally wetland vegetation.





25/0538080 | Page 19

## Wetland area 20

#### Area: 550m2

Boggy spring with standing water and floating fern (*Azolla rubra*), otherwise dominated by monkey musk, raupo, pukio and the ubiquitous seral exotic mix.





25/0538080 | Page 20

## Wetland area 21

#### Area: 1800m<sup>2</sup>

Wet and boggy, standing water mixed with seral exotic mix. Adjoins, and an inherent part of ecologically significant Waikākāriki/Horseshoe Lake Reserve wetland complex, which takes on some ecological significance.





25/0538080 | Page 21

Christchurch City Council

## Wetland area 22

Area: 115 m<sup>2</sup>

Small depression dominated by creeping bent and scattered exotic and native rushes.





25/0538080 | Page 22

## Wetland area 23

Area: 170 m<sup>2</sup>

Depression dominated by creeping bent, Cyperus eragrostis common – marginal wetland.





25/0538080 | Page 23

## Wetland area 24 - Dallington Terrace

Area: 1.3ha

Mosaic of seral exotic wetland and planted native wetland species among 'semi-wetland' composition. The relatively large size and the possibility for uninterrupted connectivity with the Avon River takes on some ecological significance.





25/0538080 | Page 24

#### Wetland area 25

Area: 1100 m<sup>2</sup>

Induced wetland from overflowing stock trough. Dried mud, with margin of exotic wet tolerant herbs esp. loosestrife (*Lythrum hyssopifolia*) and water purslane (*Lythrum portula*). Tall fescue and clumps of what appeared to be *Lolium pratense* (sheep fescue). This wetland is exempt from controls owing to its artificial existence.





25/0538080 | Page 25

#### Wetland area 26 - Bexley

Area: 20 ha

A complex mosaic, core wetland area (central area) with standing water, native rushland and seral exotic wetland species. Includes areas of saline turf that reflect the inter-tidal influence of the river's historical floodplain. Hard to precisely delimit wetland areas from non-wetland, and much of the perimeter areas included as wetland is primarily based on the dominance of creeping bent (facultative wetland) with scattered native and exotic rushes throughout but also includes multiple patches of non-wetland composition - seral weedy composition include many remnant garden shrubs and trees (many dying). The areas 'uninterrupted' connection with the Avon River, its considerable size, the extensive patches of naturally occurring native wetland species present, and habitats for multiple species of waterfowl that are present makes the 'core' wetland area ecologically significant.





25/0538080 | Page 26

## Wetland area 27

#### Area: 5500 m<sup>2</sup>

Saline turf comprising a patchwork of glasswort and buckshorn plantain as the dominant cover, with creeping bent dense around edges- dynamic and changing composition. Native saline species present include sea grass, arrow grass (*Triglochin striata*), *Selleria radicans*. Usual exotic wetland weeds present. One plant giant rhubarb present (*Gunnera tinctoria*) and pampas grass that are weeds that should be controlled.





25/0538080 | Page 27

Christchurch City Council

## Wetland area 28

Area: 200 m<sup>2</sup>

Small are of wetland impounded between river stop bank and old roads. Comprises a large grey willow and raupo, with usual compliment of seral wetland herbs





25/0538080 | Page 28

# Conclusion

The assessment highlights the presence of multiple scattered small wetlands throughout the OARC, with negligible ecological value. Four larger sites are significant for supporting remnant native wetland vegetation that represent remnant natural floodplains that also present important opportunities for ecological restoration. Invasive species remain a key challenge for wetland conservation in the area.

# References

- Clarkson, B. R.; Fitzgerald, N. B.; Champion, P. D.; Forester, J.; Rance, B. D. 2021. New Zealand Wetland Plant List 2021. Contract Report: LC3975. Manaaki Whenua -Landcare Research, Hamilton, New Zealand
- Head, N. 2021. Waikākāriki/Horseshoe Lake: Summary Report on management issues and opportunities associated with construction of stormwater wetlands on adjoining land. Christchurch City Council, Parks and Asset Management. Record Number: 22/1000659
- Head N. 2024. Ecological Impact-Proposed Removal of Road Surfaces and Associated Ecological Enhancement ANZAC Drive, Ōtākaro Avon River Corridor. Christchurch City Council, Parks and Asset Management. Record Number:25/469128.
- Leathwick, J. R.; Wilson, D.; Rutledge, D.; Wardle, P.; Morgan, F.; Johnston, K.; McLeod, M.; Kirkpatrick, R. 2003. Land Environments of New Zealand, Nga Taiao o Aotearoa. David Bateman Ltd, Auckland. 184 pp.
- McEwen, W. M. (editor) 1987. *Ecological regions and districts of New Zealand, third revised edition (Sheets).* New Zealand Biological Resources Centre Publication No 5. Department of Conservation, Wellington.
- Ministry for the Environment 2007. *Protecting our Places. Introducing the national priorities for protecting rare and threatened native biodiversity on private land.* Ministry for the Environment, Wellington.
- Ministry for Environment 2020. *National Policy Statement for Freshwater Management 2020.* Ministry for the Environment, Wellington.
- Ministry for Environment 2021. *National Policy Statement for Indigenous Biodiversity*. Ministry for the Environment, Wellington.
- Ministry for the Environment. 2021. *Defining 'natural wetlands' and 'natural inland wetlands*. Wellington: Ministry for the Environment.
- Ministry for the Environment. 2022. *Pasture exclusion assessment methodology.* Wellington: Ministry for the Environment.
- Ministry for the Environment. 2022. Wetland delineation protocols. Wellington: Ministry for the Environment.
- Walker, S.; Cieraad, E.; Barringer, J. 2015. *The Threatened Environment Classification for New Zealand 2012: a guide for users*. Landcare Research, 27 p. Landcare Research New Zealand Itd, Dunedin.
- Wilson, H. D. 1992. Banks Ecological Region. Survey report for the New Zealand Protected Natural Areas Programme, Survey Report No 21. Canterbury Conservancy, Department of Conservation, Christchurch, New Zealand.

