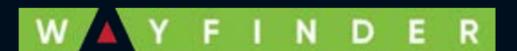


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Cross Country Drain Enhancement
Prepared for Hawke's Bay Regional Council
Wayfinder Landscape Planning and Strategy Ltd
February 2018



Landscape Planning & Strategy

DRAFT



Title: Cross Country Drain Enhancement

Prepared for: Hawke's Bay Regional Council
Date: February 2018 - Revision 2

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Cover photograph: Cross Country Drain, Shannon Bray





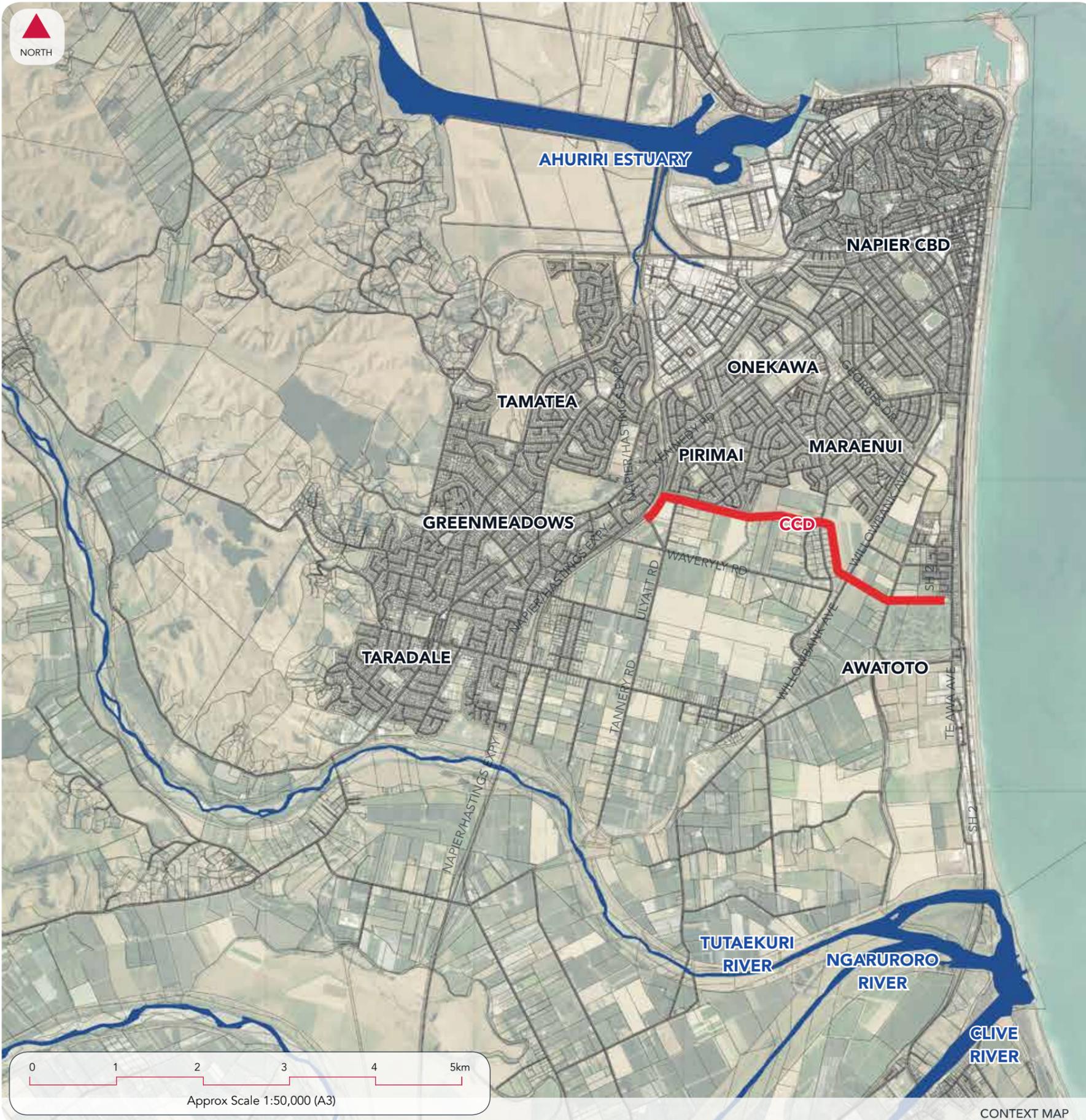
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Cross Country Drain Enhancement

February 2018

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LEGEND

- Natural waterways
- Cross Country Drain
- Roads

CONTEXT OVERVIEW

Cross Country Drain (CCD) is a 4.3km open drainage channel located south of Napier running east between the Napier/Hastings Expressway and the pump station located on Te Awa Avenue. The drain, completed in 2009, is designed to provide significant drainage and stormwater pumping capacity for future urban expansion, as well as an additional greenbelt.¹

Heading east, the CCD passes underneath Ulyatt Rd, Riverbend Rd, Willowbank Ave and Erikson Rd through concrete culverts. The drain runs through rural and urban areas, adjacent to properties and businesses including the Maraenui golf course, the New Zealand Motor Caravan Association Inc (NZMCA) Parkover at the eastern end of the drain, and Instant Green at the western end.

Within close proximity (1km) of the drain are community facilities including schools, recreational parks, marae and the coastal shared path trail. Although a majority of the CCD is fenced, it is currently used informally by walkers. There are also connections with other lineal drain systems including Plantation, County and Purimu drains.

The adjacent context map provides an overview of the wider vicinity illustrating how the CCD (identified in Red) sits within the region.

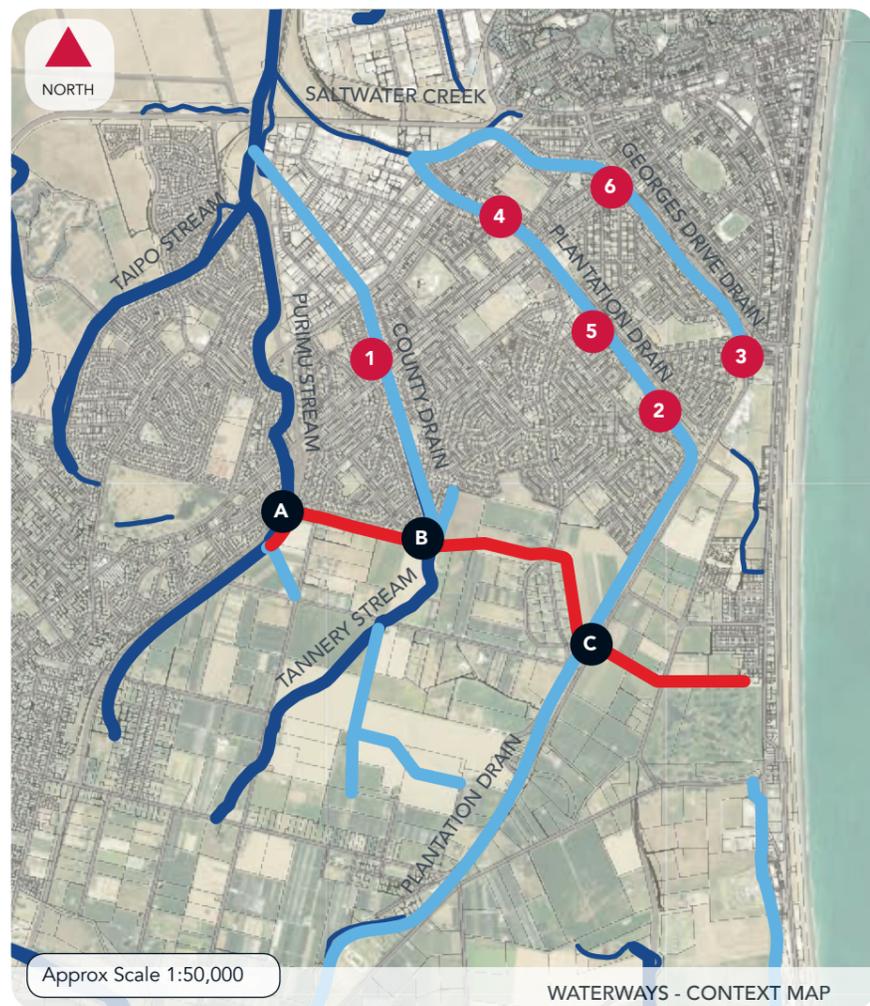
The following pages further detail the context in which the CCD is located, identifying existing cycle and walking paths, waterways, recreation and biodiversity.

This document does not cover mana whenua values, but these should be developed across the drainage corridor.

CONTEXT MAP

Aerial photo 2014-15 sourced from linz.govt.nz

1. A Smart Stormwater Asset, Graham Levy, Beca, 2011



Aerial photo 2014-15 sourced from linz.govt.nz



1. County Drain, Kennedy Road



2. Plantation Drain, Harakeke Walkway



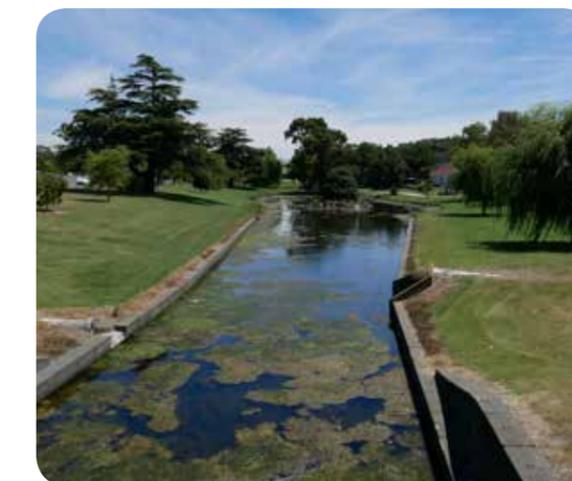
3. Georges Drive Stream, Nuffield Ave



4. Plantation Drain, Riverbend Road



5. Plantation Drain, North Street



6. Georges Drive Stream, Kennedy Road

LEGEND

- Streams
- Drainage systems
- Cross Country Drain
- 1 Photo Locations
- A Intersecting drainage systems

WATERWAYS

Rivers, streams and drainage channels in the vicinity are illustrated in the Waterways Context Map (above left).

TANK (Tutaekuri, Ahuriri, Ngaruroro, Karamu), a project formed in 2012 by HBRC and stakeholders, focuses on the health of the waterways in Hawke's Bay. TANK locates CCD within the Ahuriri catchment, with many urban areas and drainage issues. This catchment has been identified as a high priority area to reduce contaminants, improve storm water management, and increase margin and riparian planting.

In relation to CCD, 3 drains run perpendicular to, and flow into the drainage corridor. Purimu Drain connects to CCD at Point A, allowing the Purimu system to overflow at higher flood levels and excess water diverted along CCD. County Drain intercepts with CCD at Point B and Plantation Drain at Point C, both of which can back-flow into CCD when flood levels are high.

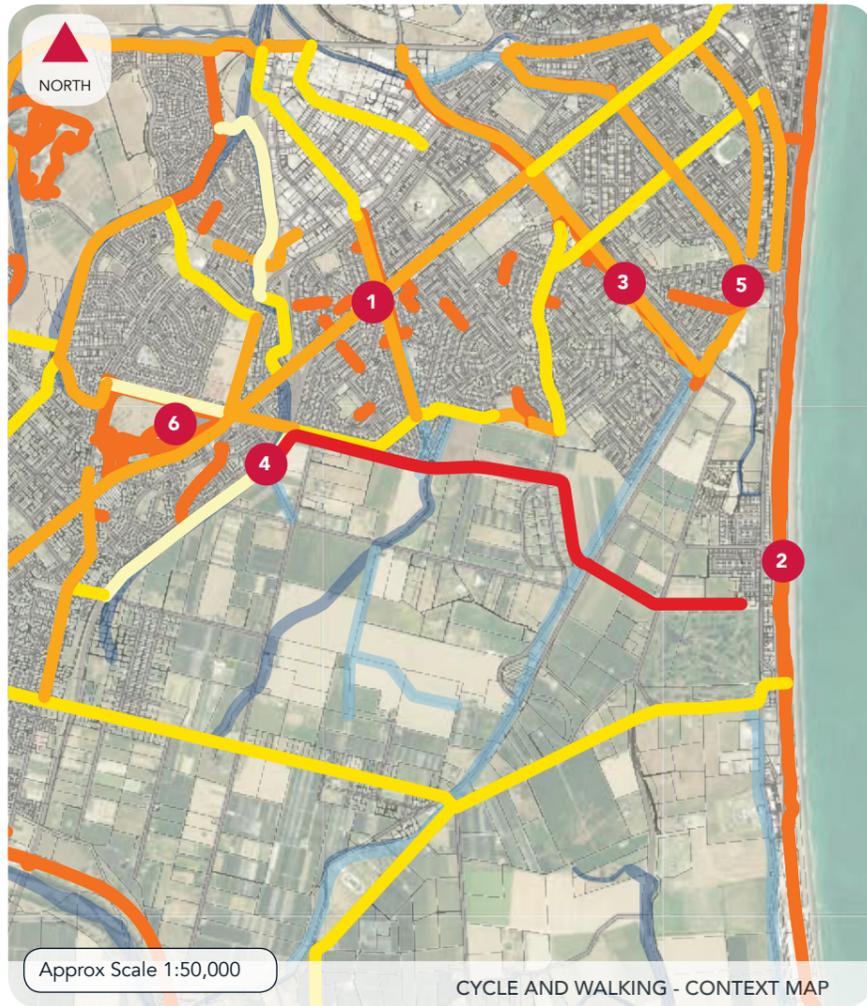
A similar drain to CCD in terms of scale and gradient is Georges Drive Drain, located in Napier (parallel to Georges Drive and Douglas McLean Ave), feeding into Saltwater Creek and the Ahuriri inlet. Although the size of these drains are similar, Georges Drive Drain has areas that are substantially concreted, limiting opportunities to enhance the water quality.

Most open drainage channels in the Napier area have been developed as green belts, with large amenity trees and shared paths, providing

access along the length of most corridors. However, there has been no enhancement of most of the waterways to increase water quality.

It is important to remember CCD is a drainage channel, not a natural waterway, however with a national interest in the quality of water, there is increasing pressure to enhance the overall quality of waterways.

Harakeke Walkway, completed in 2012 is located within the Plantation Drain Reserve, and is an example of a functioning drainage channel that has been developed with the intent of increasing biodiversity and amenity values within the drainage reserve. Changes to the waterway channel were made to slow the water down and extensive planting of the waterway and banks is now well established. Specimen trees, increased vegetation and development of cycle and pedestrian paths all contribute to providing functioning drainage, increased biodiversity and recreational corridor.



Aerial photo 2014-15 sourced from linz.govt.nz



1. Plantation Reserve, County Drain, Kennedy Road



2. Coastal Trail



3. Marewa Walk, Plantation Drain, Nash Street



4. iWay trail, Cross Country Drain, Waverley Road



5. Marewa Walk, Georges Drive Stream, Nuffield Street



6. Anderson Park, Kennedy Road

LEGEND

- Existing HBRC and iWay trails
- Existing NCC trails
- New or proposed on-road trails
- New or proposed off-road trails
- Cross Country Drain
- Photo Locations

CYCLE AND WALKING TRAILS

There is a network of cycling and walking trails providing connections throughout the Hawke's Bay region. The existing network of trails, illustrated in orange toned lines on the adjacent map (top left), are a result of a collaborative effort between Napier City Council, Hawke's Bay Regional Council and the iWay Napier initiative. The iWay Napier network is aimed at connecting residential areas with employment areas, schools, education centres, reserves and recreational areas.

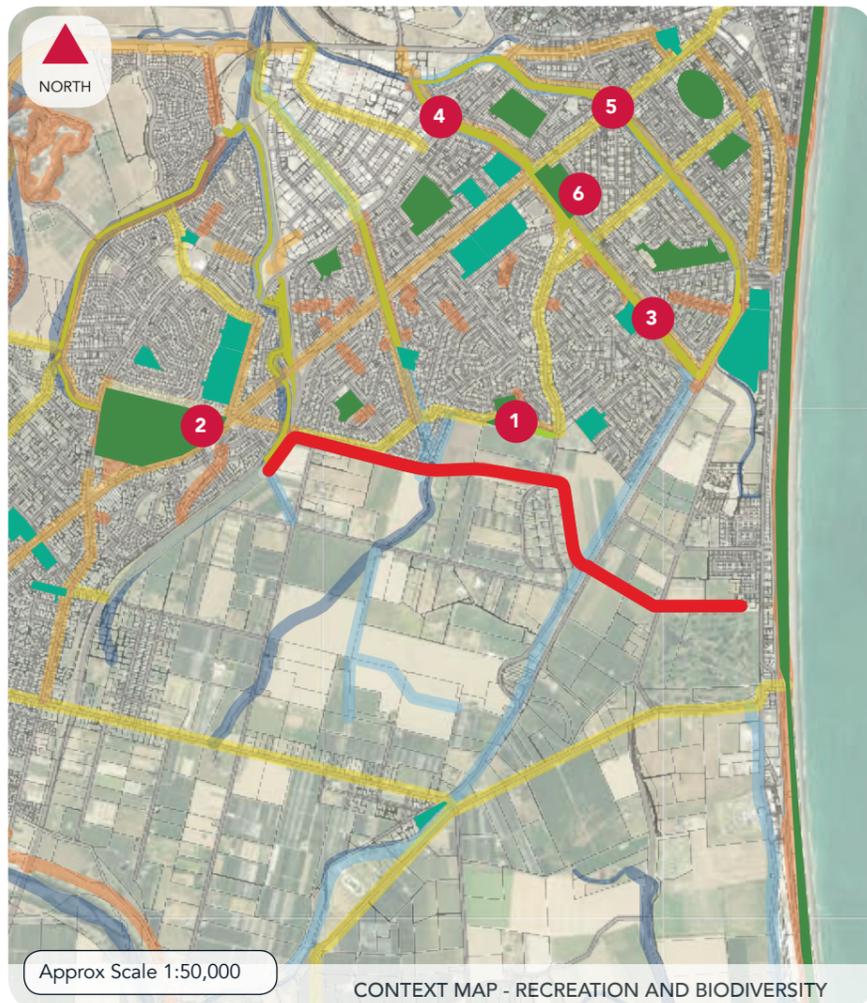
As illustrated in yellow lines there are future plans for development of on and off-road tracks, some of which have been newly implemented.

To increase the number of safe and connected routes for people to cycle to school and work, a series of drainage reserves within Napier's urban area has been implemented along drains of a similar nature to the CCD corridor, such as the Marewa Loop and Harakeke Walkway.

The Hawke's Bay Regional Cycle Plan (2015), outlines the need for improved cycle infrastructure in the interest of safe cycling to help improve health, tourism, and potentially reduce transport congestion and costs.

The 10 year goal aims to significantly increase the number of school children cycling, short trips taken by bike, connections to amenities and commuter destinations and further development of tourism experiences.

Developing a shared path within the drainage corridor could respond to the HBRC Cycle Plan and provide opportunity for the outlined objectives, with the potential to develop further connections between the CCD and the existing network of cycle and walking trails.



Aerial photo 2014-15 sourced from linz.govt.nz



1. Maraenui Park



2. Anderson Park, Greenmeadows



3. Harakeke Walkway



4. Plantation Drain, Riverbend Road



5. Georges Drive, Kennedy Road



6. Kennedy Park, Storkey Street

LEGEND

- Green corridors
- Parks and reserves
- Schools
- Marae
- Cross Country Drain
- 1 Photo Locations

“Council had a clear preference for the wider drain corridor option, both from a drainage maintenance point of view, and also because of the wider amenity function it could provide.”

Napier's Cross Country Drain - A Smart Stormwater Asset
Graham Levy, CH2M Beca Ltd, 2011

RECREATION AND SCHOOLS

Illustrated in the adjacent map (top left) are existing recreational spaces, schools and green corridors, many of which are located within the urban context of Napier. There is a correlation between these spaces, drains, and the existing or proposed shared paths providing connections to, or within these spaces.

There are recreational spaces located within reasonable proximity to CCD including Anderson Park in Greenmeadows to the west, and the coastal foreshore beyond the east end of CCD. However most parks, schools and marae are disconnected to CCD.

The open space of CCD which is currently used informally for walking/ dog walking, may provide an opportunity to develop the drainage corridor with a focus on enhancing the amenity, recreation and connectivity values, that could be beneficial for both the immediate and wider network of open spaces and community.

There could also be an opportunity to accommodate for recreational activities additional to walking and cycling within the CCD, including horse riding and picnicing along the berms.

BIODIVERSITY

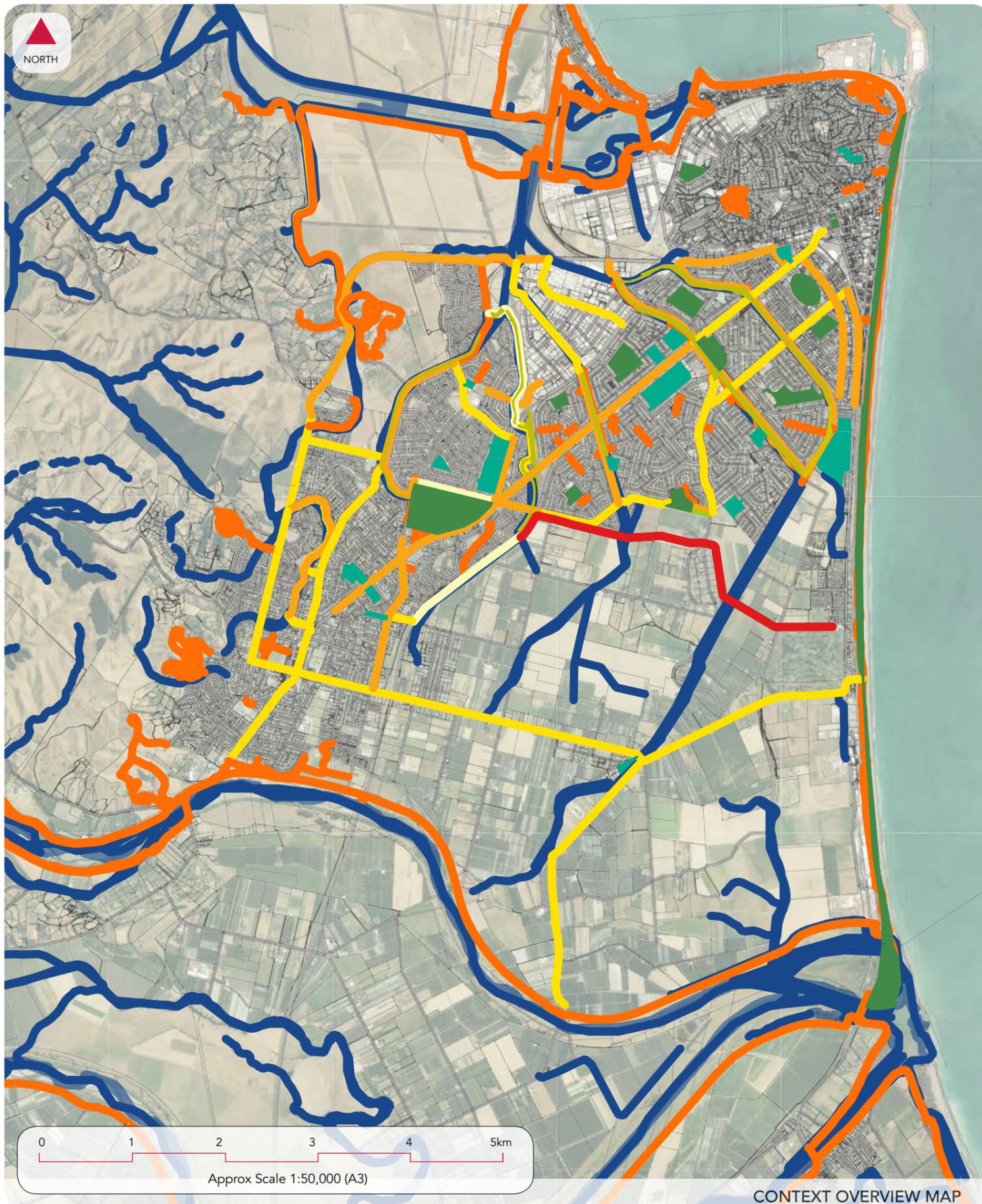
CCD was identified as a preferred option by council, partly for the wider amenity function it could provide. Although it appears there was intention to develop amenity values within the drainage corridor, little has been implemented to date.²

The Greening of Napier project was undertaken 2010-2014 that included planting of trees across Napier's major roads and open spaces. Reflecting this across the drainage corridor could help tie in the project to the wider Napier open spaces.

The HBRC Regional Biodiversity Strategy can be used as a guide to improve native species habitats and population within Hawke's Bay. There could be an opportunity to develop wetland and riparian planting along the drainage channel that responds to the strategy by aiming to enhance water quality, nutrient cycles and pollination. The strategy also addresses involvement of Maori values and the wider community.

Cape to City is a Hawke's Bay project that aims to transform the landscapes of the region so that 'Native species thrive where we live, work and play'. Enhancing biodiversity across CCD will reflect the goals set by this project.

2. A Smart Stormwater Asett, Graham Levy, Beca, 2011



CONTEXT OVERVIEW MAP

Aerial photo 2014-15 sourced from linz.govt.nz

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LEGEND

- █ Rivers and streams
- █ Drainage systems
- █ Existing HBRC and iWay trails
- █ Existing NCC trails
- █ New or proposed on-road trails
- █ New or proposed off-road trails
- █ Green corridors
- █ Parks and reserves
- █ Schools
- █ Marae
- █ Cross Country Drain

OPPORTUNITIES

In relation to the context, there are potential opportunities for development of CCD that may be beneficial for the immediate context and wider region.

Further development of cycle and pedestrian trails across the region have been proposed and some already implemented. Extending this across CCD will provide a link between the western suburbs and the coast where there is currently a lack of connectivity. There may be an opportunity to extend on or off-road connections from exiting trails to CCD.

Expanding recreational opportunities within CCD beyond a shared path may accommodate for informal recreational purposes, such as dog walking, equestrian and picnicing.

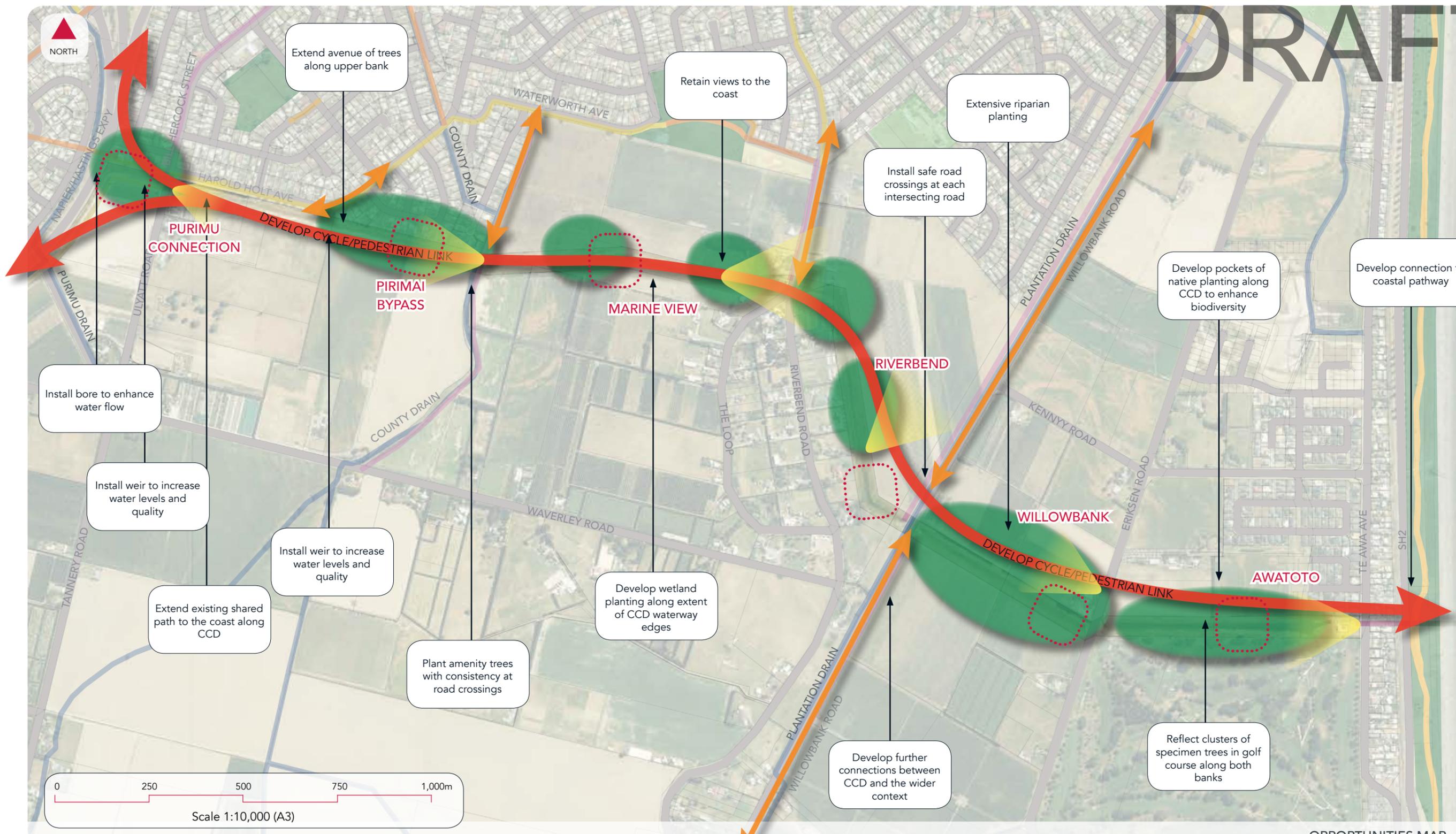
The open space within CCD provides an opportunity to develop a potential biodiversity corridor that will sit in the context of existing and future ecological pockets and corridors in the region.

Development of the CCD may provide increased biodiversity, amenity, recreational, and connectivity values to the area and wider community. Ideally an holistic approach to the enhancement of the waterway and banks would be applied.

The opportunities map (page 7), outlines key opportunities and enhancement that could be implemented across the drainage corridor. This map also splits the drain into 6 named character zones, divided geographically by each road or stream that crosses or connects the drainage corridor. Each zone has its own character that is influenced by the context, particularly neighbouring properties, local activities and views to the wider landscape. Characteristics of the drainage corridor also influence this, including the size of the waterway, slope gradient, width of the corridor, existing trees and orientation. Each character zone has been identified on the map with a name, derived from the context in which it is located.

A key area within each character zone has also been identified on the opportunities map. Each of these 6 key areas have been further detailed through concept development on the following pages (8-13), providing conceptual details of enhancement within each character area, across CCD.

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OPPORTUNITIES MAP

Aerial photo 2014-15 sourced from linz.govt.nz

OPPORTUNITIES

LEGEND

-  Location of Concept Development Plans
-  Develop cycle/pedestrian link to coast
-  Viewshafts
-  Develop links to existing shared path network
-  Develop green pockets along the CCD corridor to enhance biodiversity

PURIMU CONNECTION

The western end of CCD runs north, parallel to the Napier/Hastings Expressway before turning 90° towards the east coast.

Assessment of the drain identified the lack of water in this section despite the neighbouring property, Instant Green, irrigating adjacent to the water channel.

Installing a bore in this section of the drain would increase the volume of water, ensuring the channel has continuous water input, particularly in drier months. This would, in turn help increase ecological values and potential habitat along the drainage corridor.

In addition, installation of a weir would help to retain higher water levels within this section of CCD and other drier sections of the waterway.

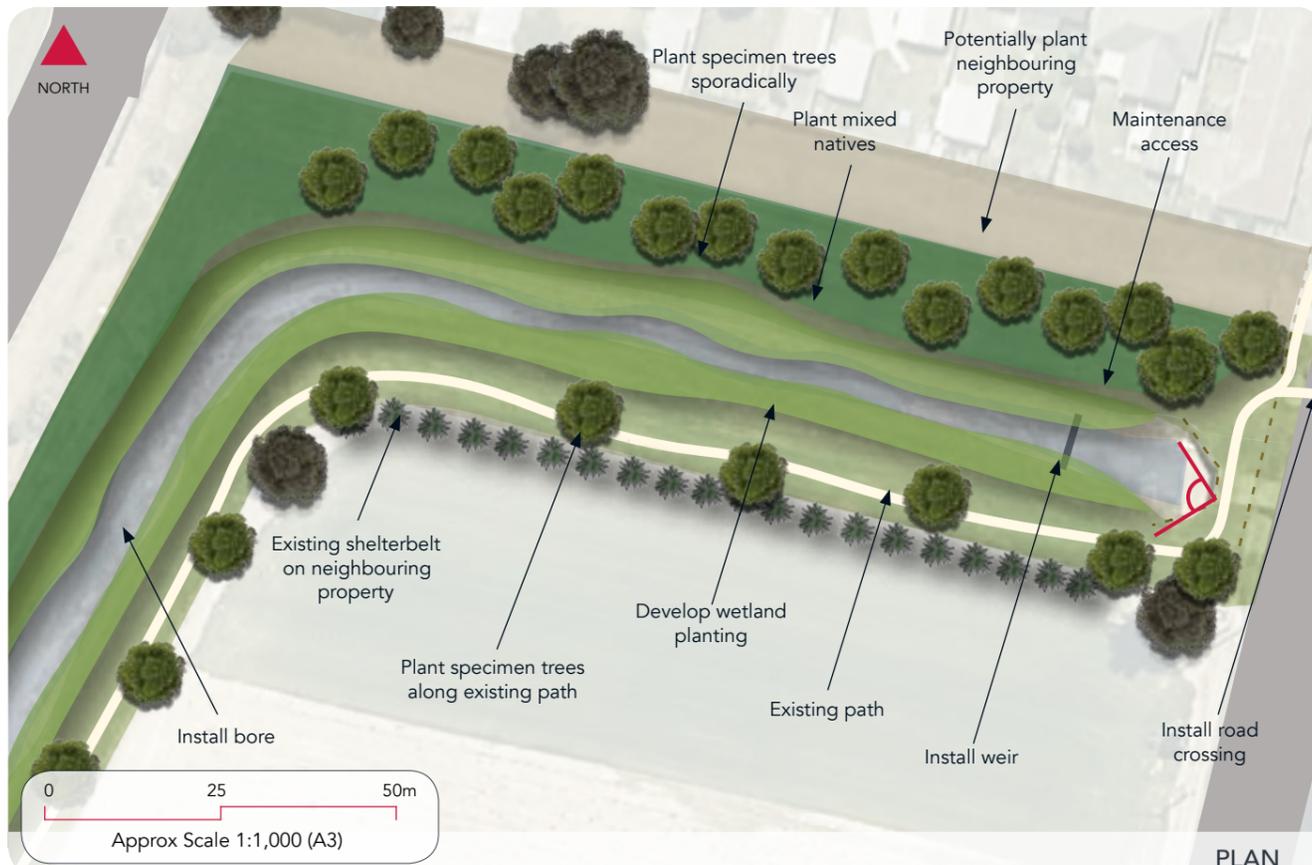
Increased wetland and riparian planting would increase the health of the waterway and provide a visual buffer between the Expressway and drainage corridor. Specimen trees planted along the north side of the drain will increase amenity values and reflect existing trees to the east along the 'Pirimai bypass' section of the drain.

Introducing specimen trees where the shared path will be required to cross Ulyatt Road, can be replicated at crossings where other roads intercept with the drainage corridor.

A newly developed shared path has been installed parallel to the Napier/Hastings Expressway, between CCD at Ulyatt Road and the underpass that passes under the Expressway near Burness Road. This provides a connection between the suburbs on either side of the Expressway. Installing a crossing at the road and extending the path along the length of the drain will provide further connections to this.

LEGEND

- Grass
- Wetland planting
- Riparian planting
- Shared path
- Fence
- Planting beyond boundary
- Existing trees
- Proposed trees
- Water channel
- Weir
- Artistic impression



Aerial photo 2014-15 sourced from linz.govt.nz

PIRIMAI BYPASS

As the drain flows east, the channel passes the outer urban edge of Pirimai, initially running parallel to Harold Holt Ave. There are existing mature specimen trees located between the road edge and the boundary of the drainage channel as well as a selection of more recently planted specimen trees along the northern edge of the drainage corridor as it approaches the County Drainage System.

Planting of amenity specimen trees extended along the northern berm would reflect both the trees existing within the drainage corridor and on the Harold Holt Ave verge.

A shared path along the length of CCD could be extended through the avenue of existing and proposed trees on the northern bank.

There is potential to install a shared path between this section of the drain and the wider network of trails by extending a path along the edge of the drain running directly between the CCD corridor and Waterworth Ave (see Opportunities Plan, page 7)

This section of the drain was reasonably dry when visited, as shown in the adjacent photos. Small weirs fed from the proposed bore in the Purimu

Connection zone could be installed to ensure consistent water levels are maintained, reducing low stagnant water and muddy areas that can appear unattractive and produce undesired odours.

Developing wetland planting along the edge of the waterway can enhance biodiversity values through enhanced quality of water and habitat.

Planting pockets of native vegetation along the southern side of the banks could enhance CCD as a habitat corridor accompanied by sporadically placed specimen trees providing further shade and diversity across the corridor.

LEGEND

- Grass
- Wetland planting
- Riparian planting
- Shared path
- Fence
- Existing trees
- Proposed trees
- Water channel
- Artistic impression



LOCATION OF PLAN



ARTISTIC IMPRESSION - SHORT TERM VISION



Aerial photo 2014-15 sourced from linz.govt.nz



ARTISTIC IMPRESSION - LONG TERM VISION

MARINE VIEW

The drainage channel passes through an area of rural land that is occupied by agricultural and horticultural activities. There are some taller trees in the surrounding properties, mainly consisting of poplars and willows with a few specimen trees in a residential property, however the majority of this zone consists of large open areas with wide views. This should be reflected in this area of the drainage channel.

There is a significant viewshaft to the coast, easily recognisable by the iconic Norfolk Pines along State Highway 2. To help retain the character of this area, it would be beneficial for this viewshaft to be preserved.

In this section of CCD (between County Drain and Riverbend Road), the waterway becomes narrower with a reasonably consistent volume of water. There is a concrete bridge crossing the drain that could be retained. Water can flood over this when water levels are higher.

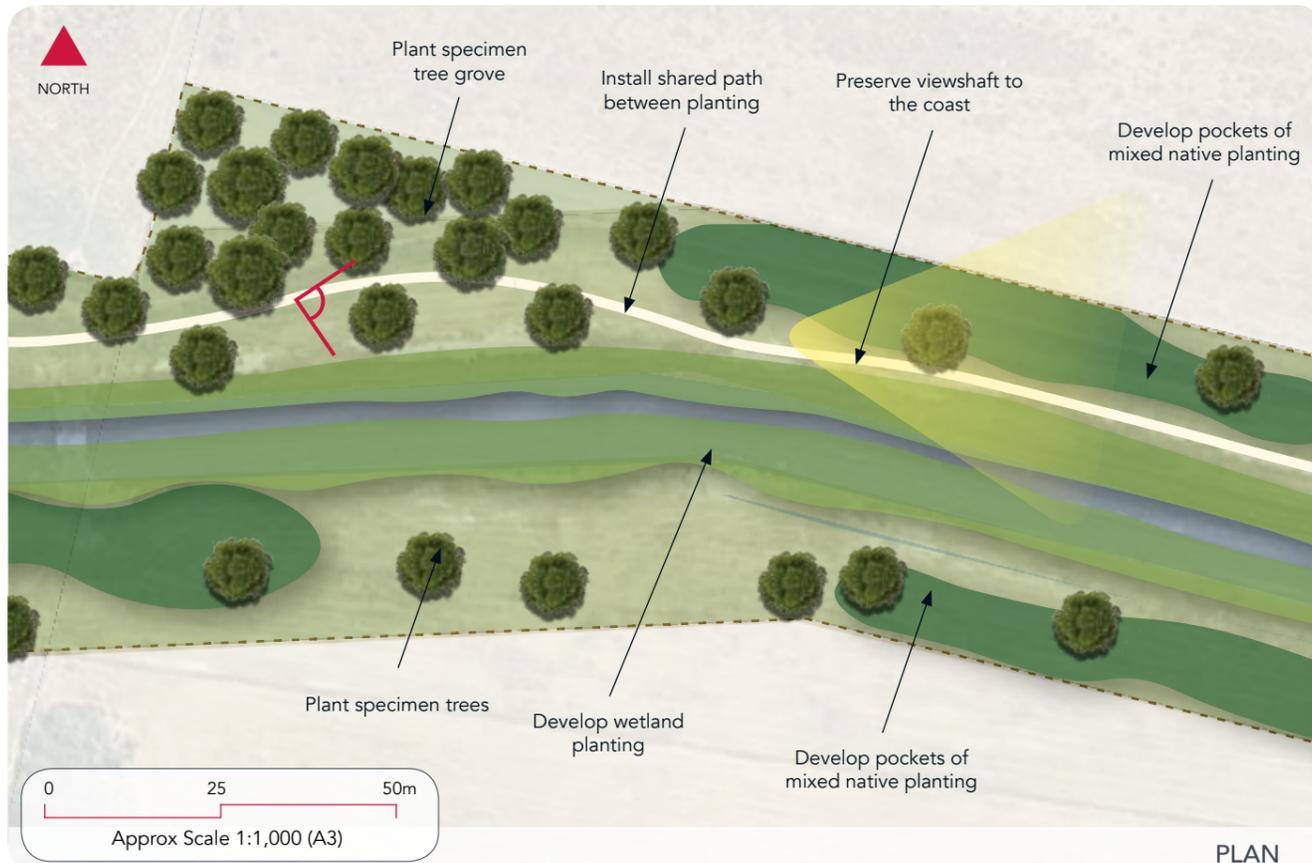
The banks are reasonably gentle and wide here, extending low wetland planting along the perimeters of the water channel will enhance water quality, habitat.

Pockets of mixed native planting along the northern and southern perimeters of the boundary would enhance biodiversity values and reduce areas that require mowing. Ensuring significant gaps between planted areas and specimen trees will ensure viewshafts beyond the drainage channel, particularly to the coast and wider landscape are retained.

A triangle of land extending beyond the top of the stop bank could be planted as a grove of specimen trees, providing a flat shaded area.

LEGEND

- Grass
- Wetland planting
- Riparian planting
- Shared path
- Fence
- Existing trees
- Proposed trees
- Water channel
- Artistic impression
- Viewshaft



Aerial photo 2014-15 sourced from linz.govt.nz

To the east of Riverbend Road, CCD turns right to head south, passing about 10 properties of approximately 1.5 acres that back onto the drainage channel, some of which are being used to grow organic produce at JJ's Organics, while other properties are resided on.

Currently this section of the drainage corridor is maintained by sheep grazing, with no restriction on stock accessing the waterway.

As a result of grazing, the banks appear less maintained and the area has a rural feel despite the close proximity to a number of 'lifestyle blocks'. There is an opportunity to enhance the amenity value of this area through alternative maintenance techniques, such as mowing and extensive planting.

Developing a shared path along the east side of the channel could help maintain privacy for properties to the west. Planting can also be used to increase privacy for these residents. However, the use of taller trees should be avoided near properties on the west bank to ensure there is no obstruction of sunlight for houses located at the eastern end of their properties.

There are larger and more consistent volumes of

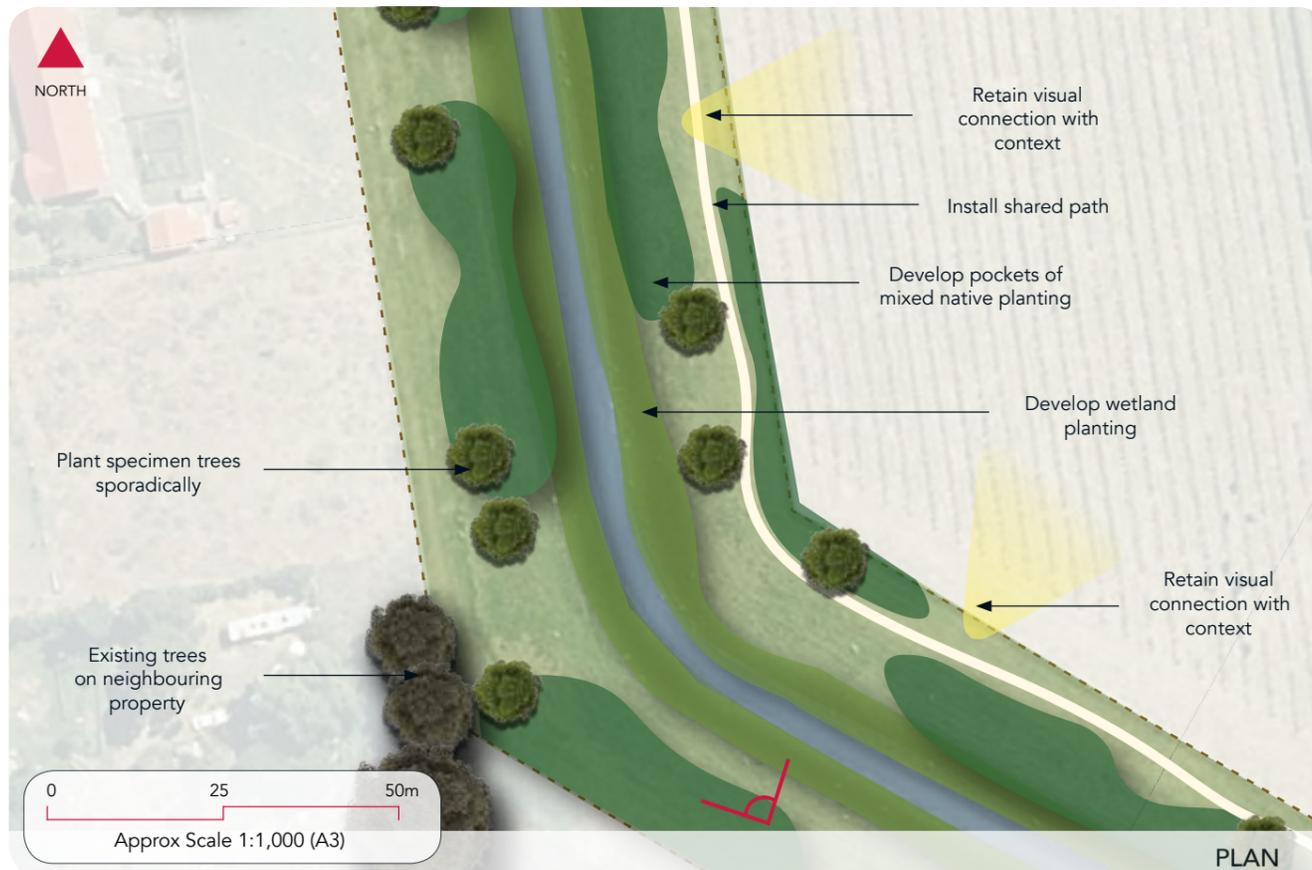
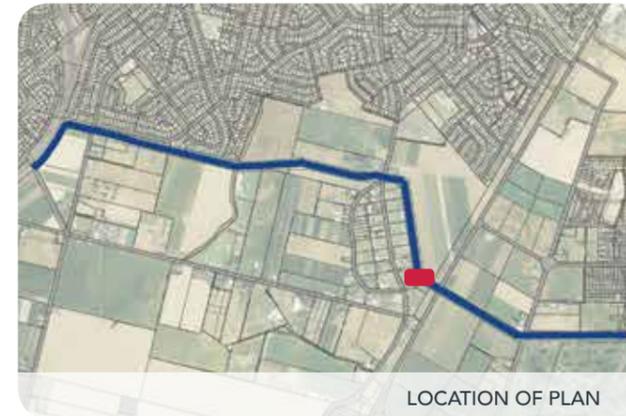
water in this section, possibly a result of the narrower water channel. Wetland planting developed either side of the water channel could be implemented to enhance the quality of the waterway.

Extensive mixed native planting in substantial pockets could be extended between the wetland planting and the boundary fence, on both sides of the drain, allowing the shared path to pass through more densely planted areas.

Maintaining views of the neighbouring vineyard to the east of the corridor will help to retain a connection with the context and the existing character of this section of CCD.

LEGEND

- Grass
- Wetland planting
- Riparian planting
- Shared path
- Fence
- Existing trees
- Proposed trees
- Water channel
- Artistic impression
- Viewshaft



Aerial photo 2014-15 sourced from linz.govt.nz



WILLOWBANK

In this section between Willowbank Ave and Eriksen Road, the northern perimeter of the drainage corridor has a hedge consisting dominantly of pine that runs along the northern perimeter from Willowbank Ave approximately 225m. A second hedge runs from Erikson Road approximately 100m. The gap in between these two hedges currently has a green mesh fence.

The northern bank could be planted out with mixed native vegetation with wetland planting along the lower slopes, providing a higher density biodiversity pocket. Ensuring space along the northern boundary would allow for maintenance access.

The south side of this zone is bordered by a vineyard to the west and the New Zealand Motor Caravan Association Inc (NZMCA) Parkover to the east, which can be accessed off Eriksen Road.

As CCD heads east, the volume of water appears to increase, possibly as the level of the drain lowers and intercepts the water table, providing seepage into the channel.

Along the south side of the drainage channel, particularly adjacent to the NZMCA Parkover,

amenity trees could be planted in an avenue parallel to the drain. The road crossing could be planted with specimen trees that tie in with other crossings within the CCD corridor.

It is proposed a shared path is located along the south side of the channel as it is slightly wider and would provide a connection to the NZMCA Parkover. This will require the shared path to cross from the north side of the drain to the south at the Willowbank Ave crossing, which is likely to be easier on the west side of Willowbank Ave where there is currently more space adjacent to the road.

LEGEND

- Grass
- Wetland planting
- Riparian planting
- Shared path
- Fence
- Existing trees
- Proposed trees
- Water channel
- Artistic impression



Aerial photo 2014-15 sourced from linz.govt.nz



AWATOTO

This zone of CCD, Awatoto, is the final stretch of drainage channel between Eriksen Road and the pumping station adjacent to Te Awa Ave. This last stretch of CCD appears to have the highest volume of water, as would be expected being the lowest section of waterway. The water channel widens as it approaches the pump station, allowing sufficient water volume for pump operation.

The Maraenui Golf Club borders the south boundary of CCD, between Eriksen Road and Te Awa Ave. Extending clusters of trees across the upper berms of the drainage channel could reflect the golf course planting.

On the northern side of the drain the landscape predominantly is rural, with cropping and grazing on two properties. However, an area of approximately 4ha adjacent to the eastern end of the drain (currently being grazed) is designated for future subdivision, therefore should be considered when planting.

As proposed for the whole extent of the drainage channel, wetland planting implemented along both sides of the water channel could help improve

biodiversity values. However, this should be used minimally or not at all around the lower end of the drain and around the pumping station to ensure there is no interference with the pumping operation.

A shared path could be installed along the south bank passing through the proposed clusters of trees adjacent to the golf course.

LEGEND

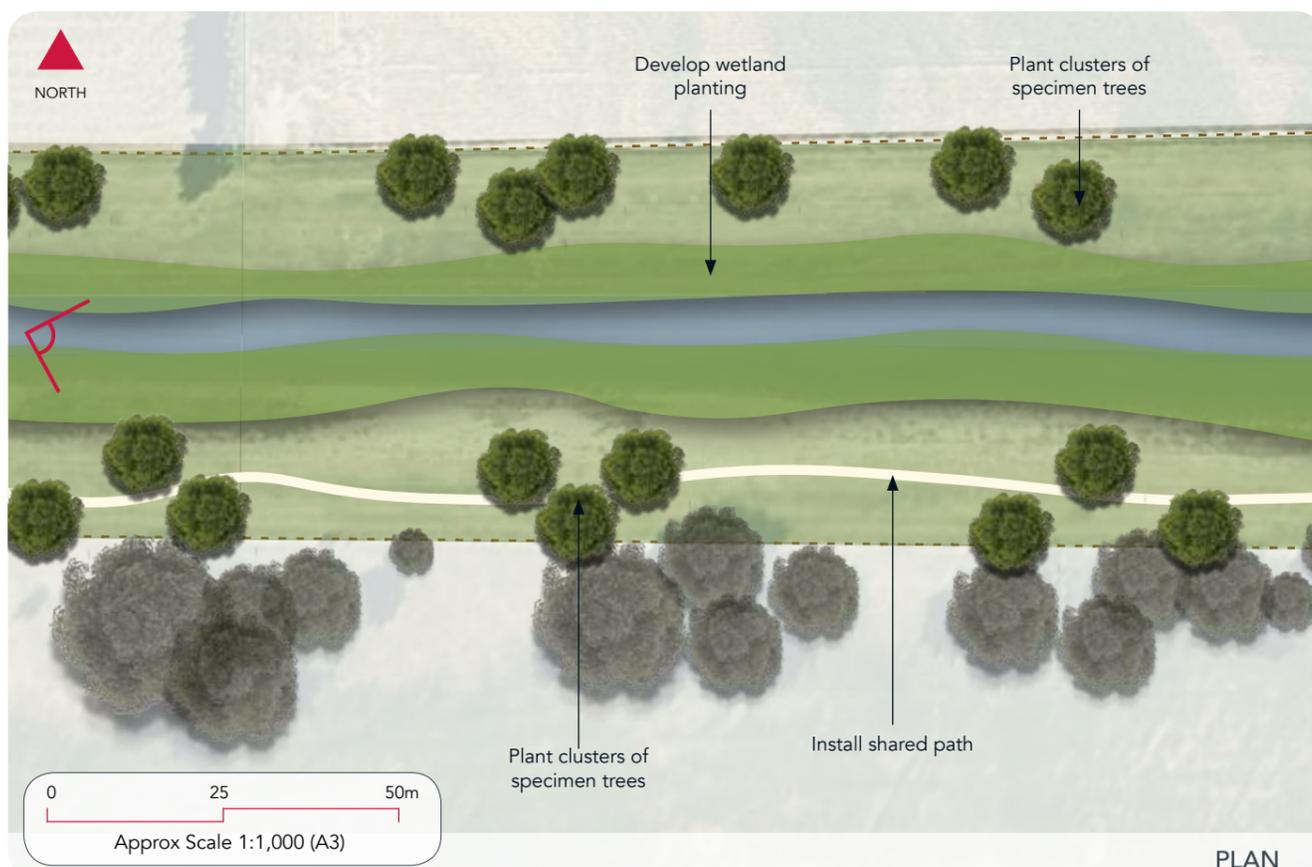
- Grass
- Wetland planting
- Riparian planting
- Shared path
- Fence
- Existing trees
- Proposed trees
- Water channel
- Artistic impression



LOCATION OF PLAN



ARTISTIC IMPRESSION - SHORT TERM VISION

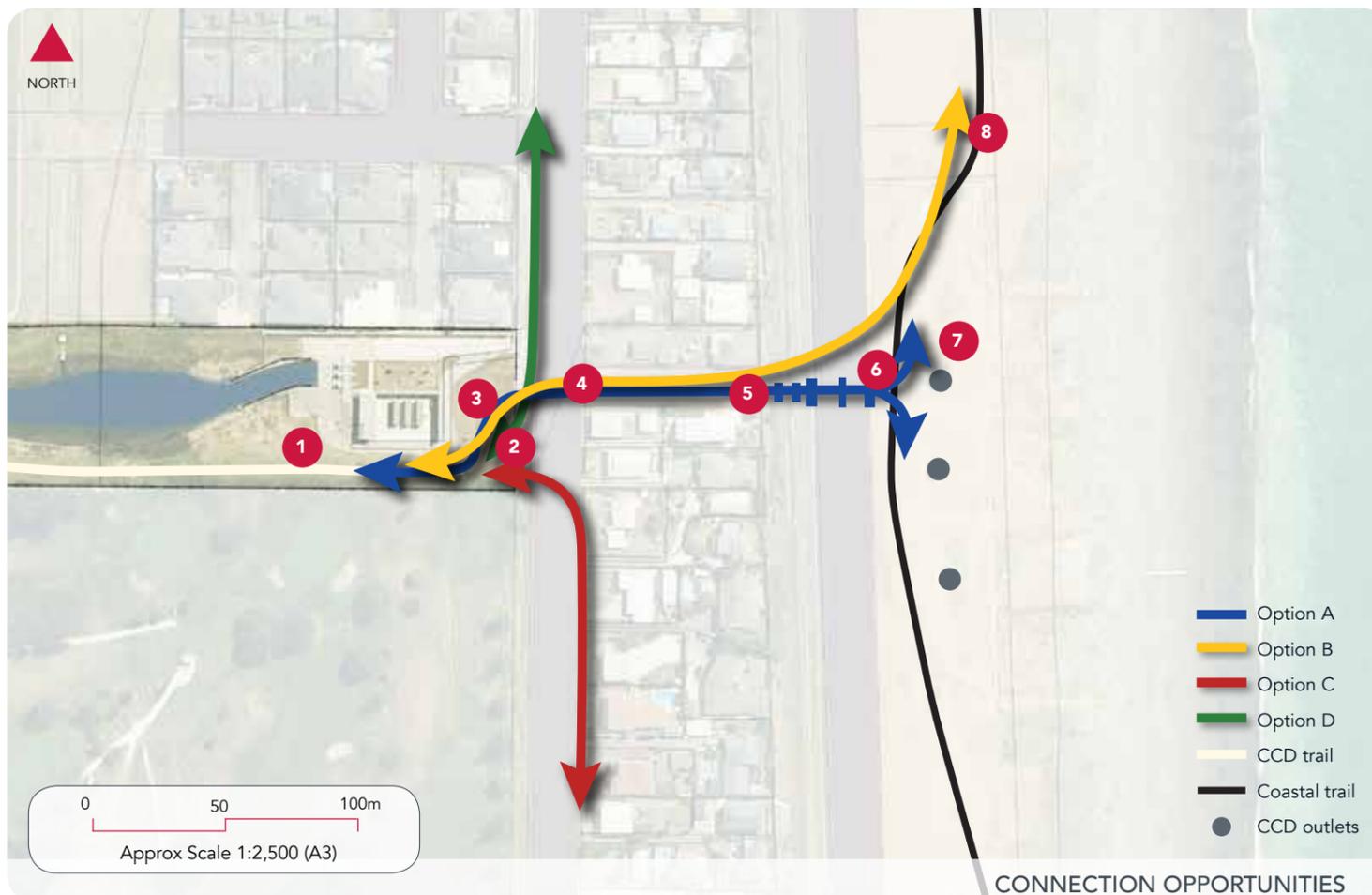


PLAN

Aerial photo 2014-15 sourced from linz.govt.nz



ARTISTIC IMPRESSION - LONG TERM VISION



CONNECTION OPPORTUNITIES

Aerial photo 2014-15 sourced from linz.govt.nz

CONNECTION TO COASTAL PATH

The CCD pumping station is located at the east end of the drainage channel where water can be pumped under Te Awa Avenue, the railway, and State Highway 2, before reaching 3 outlets on the coast. It is here the coastal cycle and pedestrian trail runs adjacent to SH2.

There could be an opportunity to provide a connection between a shared path along CCD at Te Awa Ave and the existing coastal shared path. This connection could be developed to provide a recreational corridor and means of transport between Greenmeadows and the coast.

A recreational link to the coast would require crossing the existing railway and road, there may be options that could be explored to achieve this, as outlined below and illustrated in the map (above).

Option A.
A shared path could be investigated that crosses Te Awa Ave and links through the empty 212 Te Awa Ave section, with crossings at the railway, and each lane of SH2. This may require a ramp to gain enough height up to the railway line and enough space either side of SH2.

Option B.
A cycle and pedestrian bridge could be investigated using the space available on the 212 Te Awa Ave property, gaining enough height to cross the railway line and road and curving around to the north on the coastal side.

Option C.
An alternative option could be an on-road trail that travels 500m south along Te Awa Ave and crosses the railway and SH2 at the Awatoto Road intersection, before connecting the coastal path.

Option D.
An on-road trail traveling north from CCD along Te Awa Ave could be investigated, however connection to the coastal trail would not be possible until reaching Ellison Street, 2.4km north of CCD.

Options for a connection between CCD and the coastal trail requires further assessment of options.

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SHARED PATH CONNECTIONS

There are many access-ways to the drainage corridor currently used for maintenance purposes, located at each road in which the drain passes under; Ulyatt Road, Riverbend Road, Willowbank Road, Eriksen Road and Te Awa Ave. There may be opportunity for these to be used for public access.

There could also be an opportunity to install an entrance from Harold Holt Ave and a path along the drain between Country Drain and Waterworth Ave.

With the proposal of a shared path along the length of the drainage channel, safe crossings at each road would be necessary. Ideally road crossings would use the same design across the extent of the CCD corridor to ensure cohesiveness across the drainage corridor and the wider region. This can be further reinforced by incorporating similar trees at each crossing/entrance to the corridor.

Beyond the boundaries of CCD there may be an opportunity to develop cycle and pedestrian connections between CCD and existing shared paths in the region with on and off-road paths along Riverbend Road, Willowbank Ave, Eriksen Road and Te Awa Ave.



Shared path road crossing, Nuffield Ave



Shared path road crossing, Kennedy Road

PLANTING

Planting should not effect the capacity of the drainage channel, particularly in the event of flooding. However, planting should be chosen to benefit biodiversity values, particularly in a freshwater environment.

Planting illustrated on the concept plans (page 18-13) are identified as wetland, riparian and specimen trees. The remainder being the waterway and grassed areas.

Wetland planting should consist of plants that shade and filter the waterway, can survive wet soils and withstand flood events.

Ideally riparian planting will consist of a simple planting palette, preferably self-sustaining and low maintenance.

Specimen trees should be high limbed to retain views to the wider context and within the corridor, as well as ensuring security. Trees should vary in species, and ideally respond to existing trees within CCD or the immediate context.

To ensure maintenance within CCD can be undertaken, space for mowing should be considered when planting and maintenance access accommodated for.

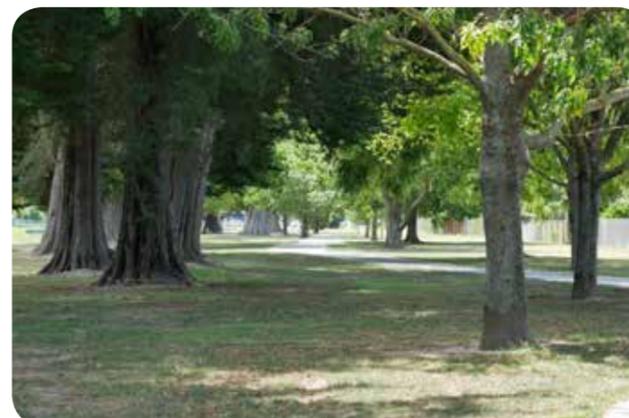
Extending planting along intersecting drains such as County Drain, may benefit neighbouring residents and the overall health of CCD and connecting drains.



Wetland and riparian planting, Harakeke Walkway



Riparian planting, Harakeke Walkway



Speciment trees, Kennedy Road



Specimen trees, Nash Street

DRAINAGE

It is important to remember that CCD is a drainage system, that supports a number of drains and drainage requirements within the region. Any enhancements should not reduce the drainage capacity and function.

To ensure maintenance can be undertaken, the drainage channel and culverts should be easily accessible.

While CCD is primarily a drainage channel, there is potential that functioning drainage can coexist with enhanced biodiversity, recreational and amenity values.

CULTURAL

Waterways hold great significance to mana whenua, environmentally and culturally. Tāngata whenua consider an awa as a whole with interdependent parts including flora, fauna, fish and insects which are affected by the health of the awa, and vice versa.

Reflecting cultural value within public spaces can help to promote kaitiaki and guardianship of those spaces and help educate people about looking after them for generations to come.

Māori values have not been covered in this document, however opportunities to develop mana whenua values across the drainage channel should be considered.



County Drain, at CCD



Pou, Harakeke Walkway

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