Big Plans for 11 CCC

Small Creek Channel Naturalisation

Concept Design Report



Small Creek Snapshot

- Six key things to note
- Why do this?
- Project fast facts
- FAQs
- Timing
- Before
- After



Six key things to note

ΟΙ	There is widespread community support
	to see Small Creek changed to a natural waterway

- **02** Flood modelling shows current level of flood protection to homes will remain
- **o3** There will be a big establishment hump in order to reach the end goal
- **04** *Everyone's* expectations about what Small Creek looks like will need to be managed
- **05** Ongoing stakeholder collaboration with traditional owners, local community and council is essential
- **o6** High upfront maintenance costs will taper out in the long term, with ongoing stewardship

Small Creek Snapshot 5

Why do this?

Small Creek was once a meandering stream that flowed into Deebing Creek.

Today it's a straight concrete channel that offers very little value to the community or environment. Returning Small Creek from a concrete drain to a natural waterway will provide:

- + cleaner water
- + wildlife habitat
- + fewer stagnant ponds
- + allowance for better path and bikeway connections
- + opportunities to incorporate traditional owner stories and activities
- + educational opportunities
- $\,+\,$ access to nature for play and enjoyment
- + ability to use developer-contributed funds for a large scale community project
- $+ \;$ potentially increased property values







each year



years of staged construction



planned cyclepaths plus discovery trails

Small Creek Snapshot 7

Background

What's the history of Small Creek?

The concrete drain running from Whitehill Road to Warwick Road through Raceview was once known as Small Creek, and was a winding natural stream that flowed into Deebing Creek. Today, it's a straight concrete channel that offers very little value to the community or environment.

Like most waterways, it was surrounded by large iconic tree species such as the Queensland blue gum, with an understorey of native grasses and rushes. In the early days following European colonisation of the area the waterway was cleared and grazing introduced, instigating a period of ongoing decline.

This led to the creek being replaced in the early eighties with the concrete drain that we see today.

The few trees that still exist are remnants of the original landscape along the creek that once upon a time would have had their roots in or close to the water.

Council is undertaking a significant project to reinstate Small Creek as a natural waterway to provide cleaner water for the community, habitat for birds, options for path and bikeway connections and the opportunity for you to enjoy a natural waterway in your neighbourhood.

Why here, why now?

Why choose Small Creek?

Small Creek offers a unique opportunity to enhance the natural beauty of the area, improve waterway health and provide better active transport options and connection networks for the community.

Why does the concrete channel need to be removed?

The area was originally a creek before it was turned into a concrete channel. In its current state, the channel contributes to the degradation of water in our creeks and rivers, as the hard surfaces in urban areas result in more runoff of pollutants. This dirty water travels very quickly down the channel, causing erosion that leaves stagnant pools for mosquito and cane toad breeding, and poor water quality in downstream Deebing Creek. The Small Creek project will help to reduce these problems.

Why don't we spend this money elsewhere?

This project is funded by developer contributions under Council's water quality offsets scheme. It is a legal requirement that Council spend any money collected under the scheme on water quality improvement projects, a primary component of the Small Creek project.

Where will the new creek be?

Small Creek will run in the general location of the current concrete channel, meandering through the area from Whitehill Road to Warwick Road. Property boundaries and underground pipes mean it won't follow the old creek alignment seen in the 1946 aerial photograph, but creeks naturally move about and this creek wasn't always as seen in 1946.

How will it look and function?

What will Small Creek look like?

The concept design for Small Creek draws from the thoughts and ideas provided by 180+ people during Design Your Creek Week. Whilst it has to join into existing pieces of drainage infrastruture, the intention is that Small Creek will look like a natural waterway, with native vegetation, pools and shallow, running sections of water.

How will Small Creek benefit me?

Returning the creek to a natural state will result in:

- + Improved aesthetics, with the creek appearing as a naturally occurring waterway over time.
- + Cooler water in our waterways, a vital requirement for native fish species.
- + Improved environmental outcomes via better water quality and habitat for animals and plants.
- Provision of improved active transport connections for residents.
- + Potentially improving the value of property surrounding the corridor by the implementation of a naturalised area. Research evidences an increase in value of property surrounding similar local projects of between \$17,000 to \$26,000, well above current property value trends.

What about flooding?

Throughout the design phase extensive modelling will be done on the creek and surrounding area to ensure that Small Creek poses no additional flooding risks and addresses existing flooding issues where possible.

Timing

The Concept Design phase of the project is now complete. Detailed Design is planned for the first half of 2017. The first stage of construction will commence in late 2017.

These phases of work are complete

Small Creek designated

recipient of funding

December 2016

Design concept finalised

June 2017

Detailed design finalised

Approval of design concept from public & council

These phases of work are still to be done

catchment

October 2016

Ipswich City Council engages consultant team including engineers and landscape architects

November 2016 Design Your Creek Week



stormwater offsets policy



2018 onward

Small Creek naturalisation continues as Raceview grows and develops

> Ongoing community activities



Small Creek Snapshot 9



Project extent showing existing Small Creek 2016

Whitehill urches of Chri H

e courtesy of Nearmag



After

Project extent showing proposed , Small Creek 2086

Whitehill urches of Ch

Small Creek Snapshot 🔳

Initial Concept Drawings

At the end of Design Your Creek Week we presented the following Sections, Sketches and Plan describing the design intent for the new Small Creek.



View looking into Small Creek from Whitehill Road.





View looking towards Poplar Street Park.



Concept Plan 16 November 2016

- Extensive tree planting for shade and habitat.
- Integration with existing stormwater pipe inlets.
- Places for a Yarning Circle and integrated artwork.
- Space for a planned bikeway along the entire corridor.
- Good visual connection along the creek.
- Specific localised earthworks to manage floodwaters.
- Well defined maintenance zones and access.
- Space for community gardens.
- Informal paths and trails for exploring.

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Listening & Learning **29**

Local Voices

Over 180 people participated in Design Your Creek Week, either attending the event on site at Poplar Street Park, or providing feedback online.

We collated all the inputs provided in notes, letters and comments and tallied how often each topic had been mentioned. In this diagram the size of the text indicates how frequently a topic was mentioned.

The letter of support on the following page was received from the four youngest members of the Pole Family.

The photos were shared by local resident, Robert Crepin, who has lived in Ironbark Crescent since before Small Creek was channelised. They show the area where the Churches of Christ is now located: at the time it was used for grazing, and many large eucalypts can been seen.



clean water education

swimming indigenous represe



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MORE WALKWAYS TO FROM LOCAL STREE We one preparent to do 4 working beeg Stepping stones . more shade a bear Harrison Famile - reating the seals THIS AS A CONCERN NO -Melisso Blemer SHS A revived hortuval Landscape & Sizmonthy Madam 3 a an outdoor education facility Shade ZIGN

Landscape Design Strategy



Elements

This diagram illustrates the eight key physical elements that will combine to make Small Creek.

- Shared path: connected, safe, equitable OI
- *Chain of ponds:* flows, riffles, ponds 02
- *Canopy trees: structure & landmark* 03
- 04 *Parkland trees:* amenity & sensory delight
- *Creek trees:* shade & continuous canopy 05
- *Sedge planting: cleansing, habitat, erosion control* 06
- Artwork & program: history, material reuse, stories 07
- **Open lawn:** play, views & running around 08

Experiences

Now - a singular experience

Small Creek currently offers all visitors, animals and people, a singular experience. The same condition is found along the entire corridor:

- + a concrete channel that's the same width the whole way along;
- + lawn extending from the edges of the concrete right up to the boundaries of adjoining properties;
- + very little shade;
- + access and movement that is very much limited to following the line of the concrete channel; and
- + minimal moments of delight or interactivity.

In the Future - diverse experiences

The concept design creates many ways in which people and animals can experience Small Creek:

- + a meandering waterway with a low flow channel that varies in width;
- clear open lawns interspersed with a mix of planting types to provide screening, create habitat and increase shade;
- + the ability to move quickly through the space or take a slower route;
- + all by taking a simple series of elements and weaving them together to create multiple combinations.





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Concept Plan



Detail Plan 03 - Crossing







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Detail Plan 01 —

School.

Road.

1

2

3

4

5

6

7

8

Warwick Bridge Wetlands



This is a small waterhole on a creek in the local area.

of the creek.



Example of a shallow wetland with forest red gum.

Reeds and rushes can grow along the wet edges



0 10 20 50 100m

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Typical Wetland Edge Sections 1:100 @ A3





___Wetland Marsh Edge

2m

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Detail Plan 02 —

Adventure Trailing

In this area there is:

Ι	Provision for connecting pathway.
2	Meandering low flow stream.
3	Extensive tree planting for shade and habitat.
4	Screen planting to fences of adjoining industrial premises.
5	Informal paths and trails with connections down to water's edge.
6	Areas of open lawn to enable long clear views.
7	Opportunity for Yarning Circle.



A direct connection to the natural world is vital for education and landscape stewardship





Clear views through to paths



Opportunity for future public art or installations







_____Wetland Trees to ______ Shade Creek

Detail Plan 03 —

Crossing Briggs

In this area there is: Provision for pathway connection to Briggs Road. 1 Screen planting to fences of adjoining industrial premises. 2 Retention of as many existing trees as possible. 3 4 Extensive tree planting for shade and habitat. Potential for existing construction compound to be used 5 during the Small Creek works and then kept as a large level area accessed from Briggs Road that can be used for kickabout space, markets or events. Informal paths and trails: also facilitate periodic 6 maintenance access to channel if required. Potential reuse of concrete removed from existing channel 7 to be reused as low retaining or informal stepping stones. Modifications to base of existing culverts to direct low flow through one culvert, keeping the others dry to facilitate 8 fauna movement. At-grade connection to Briggs Road. 9 Meandering low flow channel. 10 Open lawn behind houses, with long clear views. Π Potential connection through to Cascade Street.



There is potential to explore ways of reusing the concrete from the existing channel to form low retaining for planting, informal stepping stones, or be the canvas for artwork.





50 100m 10 20 0

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Section C-C 1:200



Section D-D 1:200



Detail Plan 04 —

Poplar Street Park

In this area there is:

Provision for pathway connection through the corridor. 1 Open lawn behind houses, with long clear views. 2 Extensive tree planting for shade and habitat. 3 Small irrigation pond at end of existing inlet. 4 Poplar Street Park. 5 Possible Poplar Street Park 'lookout' with views down 6 length of creek. Low bridge crossings. 7 Informal paths and trails: also facilitate periodic 8 maintenance access to channel if required. Screen planting to fences of adjoining properties. 9 Potential for use as community garden. 10 Provision for path connection into neighbourhood. Π 12 Existing gross pollutant trap retained.



Low waterway crossing allowing low flow under



Example of a recently revegetated stream





13

Opportunities to create informative signage and integrated artwork in the future





50



100m

Section E-E



Detail Section 1:200







al Screen Planting

Waterway crossing

Crossings will be formed from low culverts, ensuring that the low flow channel passes through a naturalised channel bed to encourage passage of fish and macroinvertebrates.

Because of the high flood water levels, it's not practical to install high bridge structures that sit above the 5% AEP or 1% AEP flood level.

Instead, considering the floods will pass quickly, the crossings will be at a lower level, which also fosters greater engagement with the waterway for the majority of the time when it's not flooding.

The neighbouring streets provide backup routes for pedestrians and cyclists if needed.

Sketch showing pathway and informal trail leading to waterway crossing



Detail Plan 04 —

Whitehill Road

In this area there is:

Provision for pathway connection to Whitehill Road. I Extensive tree planting for shade and habitat. 2 Gently sloping lawns. 3 Low planting weaving along edges of waterway. 4 Meandering low flow channel. 5 Open lawn behind garden fences, maintaining clear views. 6 Informal paths and trails with access down to water's edge 7 Informal connection to neighbourhood. 8





Connecting path with lawn adjacent leading down to waterway

Detailed planting establishing along water's edge.



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testing & refining **79**



So Big Plans for Small Creek

Sketch looking west along path with lawn beside shaded creek



Typical Low Flow Channel Detail

weeds Tubestock planted at density of 8/m² on lower floodplain



Typical Grade Control Rock Chute Detail



Longitudinal Section



Plan





Slight 'vee' shape to rock chute in the upstream direction

Learning from Traditional Owners

Listening

The Traditional Owners of the area around Small Creek are the Jagera, Daranbirrin and Ugarapul.

Nulla - Small

Warril - Creek

Traditional Owners shared their stories during Design Your Creek Week, including students and staff from Bremer State High School.

Places & Spaces

A number of suggestions were received for specific spaces along Small Creek that could be used by Traditional Owners, including:

- + Sitting Areas
- + Mat weaving place to undertake workshops using the natural resources at Small Creek - Well shaded outdoor class room for an **Education Program**
- + Yarning Circle Place
- + Totem designs for Jagera, Daranbirrin and Ugarapul.
- + Artwork by Traditional Artists.
- + Bush Tucker area

Significance for Traditional Owners

Traditional Owners have been generous in advising that the following plants are significant, and should be included:

- + Cottonwood tree
- + Currajong
- + Dianella / Flax Lilies
- + Finger Lime
- + Geebung
- + Groundcover/ foliage plants
- + Native Olive
- + Native Tomato
- + Water Reeds
- + Wombat Berry

These plants have been illustrated in the following plant palette.



Planting

Regional Ecosystem

Small Creek is part of Queensland's Regional Ecosystem 12.3.3, a Euclyptus tereticornis woodland on Quaternary aluvium soil.

Eucalyptus crebra and E. moluccana are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include Angophora subvelutina or A. floribunda, Corymbia clarksoniana, C. intermedia, C. tessellaris, Lophostemon suaveolens and E. melanophloia. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. (BVGIM: 16c)

Four vegetation communities are found within this regional ecosystem. The Biodiversity Status is mapped as Endangered -Dominant vegetation

Function, Character & Experience

The initial Plant Palette for Small Creek contains a range of species, including those that are:

- + culturally significant;
- + functionally important for a healthy creek;
- $+ \,$ useful in public realm settings; or
- + beautiful.

Many fit into more than one of these categories.

This is an initial planting palette only. The final plant selection will be drawn from this list but may also include plants not shown here, depending on detailed design, further research and testing, and availability of plant stock.

The diagram below illustrates how the character of planting changes as it transitions from the base of the channel to margins, up batter slopes and onto upper grassy floodplain.







Plant photos are shown here for reference only and may include images sourced from the internet







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Shrubs







Grasses & Groundcovers



































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Community Concerns

Snakes

The local snake catcher has advised that the cracking black soils of the local area have always been a snake habitat, and that all the new housing estates provide good habitat for snakes as they attract mice and other sources of food, and most people are oblivious to the snakes in the area. The snake catcher's opinion is that revegetation of the creek is unlikely to result in any significant change to the number of snakes in the area. Kookaburras and other birds prey on snakes and small reptiles, also helping keep the ecosystem in balance.

Mosquitos

Mosquitos thrive in small isolated pools of water such as those along the existing concrete drain that fill after storm events. In these pools, mosquitos can breed quickly where there are few natural predators.

In a healthy balanced ecosystem, mosquito larvae are kept in check by fish, tadpoles, and dragonfly and caddisfly nymphs, and adult mosquitos are hunted on the wing by dragonflies and microbats.

The concept design includes a series of deeper permanent pools that will provide habitat for fish, rock riffles that are preferred habitat for nymphs, and a tree canopy to provide habitat for bats and predatory insects. Floodplain areas are designed to be free draining back towards the main low flow channel, and there should be fewer small isolated pockets of water as a result of the works.

Cane toads

Cane toads like waterbodies surrounded by well mown grassy areas, and many of the existing stagnant ponds have lots of cane toad tadpoles. The concept design ensures all water is fringed by dense vegetation to help encourage native frogs and deter cane toads. However, cane toads are difficult to irradiate and will require ongoing management.

Typha

Typha, also known as bull rushes or cumbungi, is prevalent in the open drains upstream of the site. There are three species of Cumbungi in Australia. Narrow leaf cumbungi (Typha domingensis) and broadleaf cumbungi (Typha orientalis) are native species while Typha latifolia is an introduced plant native to Europe (Qld Dept of Agriculture and Fisheries, 2016). Generally, the leaves of the introduced cumbungi are about 1 m in length compared to 2–3 m for the native species such as those found upstream of Small Creek. It has edible lower stems and rhizomes, and can be used for weaving.

It's small wind-blown seeds rapidly colonise saturated soils and shallow water, and can spread into deeper water and form large dense stands. Along nearby waterways like Deebing Creek, Typha tends not to be found where there is a good riparian canopy as it needs ample sunlight to thrive.

In constructed drains, typha is considered an invasive weed as it can interfere with the flow of water, and the biggest problems occur when drains are engineered assuming they will have turf or short grass without regard for the impact that typha infestations will have on conveyance.

The concept design seeks to minimise the overall area of standing water and saturated soil by having a defined low flow channel, and maximising shade around permanently wet areas. In the first few years after Small Creek is naturalised, typha will invariably colonise parts of the system. And then as the canopy establishes, the prevalence of typha will significantly reduce.

Maintenance activities during the early years should focus on containing typha growth in areas where young trees are establishing to prevent the trees being shaded out.

Community Creek Care

Waterways in urban environments require ongoing care to manage invasive weeds, assist with the planting and management of desirable species, and remove litter etc.

To be successful, the management and maintenance of the creek will need to be a shared effort between Council and the local community. Community ownership has started with Design Your Creek Week. This engagement should continue through the detailed design, construction and establishment phases so that by the time the susbtantive amounts of work are complete, there will be an active amount of community ownership.

Sightlines

Currently the wide open expanses of concrete and lawn means it's easy to see a long way along the corridor from many points. The concept design will see many more plants growing in Small Creek, and so principles of CPTED - Crime Prevention Through Environmental Design - have been used to help manage perceptions of security and comfort.





Stagnant water.



The local community's help will be vital to the long-term success of the project.



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The local community's help will be vital to the long-term success of the project.



Staging

The major construction work needs to be done in several stages to align with Council's budget and cashflow provisions. This is also a good idea to manage risks, as only a portion of the site is being constructed or in early establishment at any one time, and hence exposure to major dry spells or floods is minimised. Design details and work methods can also evolve and adapt as work progresses, based on successes and failures along the way.

For most waterway and riparian works, it is logical to commence works upstream and progressively work downstream so that weeds and invasive plants are progressively eradicated and newly establishing areas are exposed to the least amount of unwanted seed and plant propagules as possible.

For Small Creek, works will happen in reverse, starting at the downstream and working upstream, for the reasons summarised below.

The uppermost reach of Small Creek covered by this concept plan—Whitehill Road to Poplar St—involves the Churches of Christ site and further work is needed to resolve the best approach to interfacing with that site in a manner that works for both the landowner and Council before works can commence. That process will not be complete by July 2017 when works on Small Creek are due to commence.

There's a large catchment upstream of the site, and so works would not be commencing at the top of the catchment in any case, and there are large stands of typha upstream of the works area that will continue to be a source of seed regardless of whether the works commenced at the Whitehill Rd or Warwick Rd end. The Warwick Rd end is close to the Bremer State High School, and commencing works there will help foster long-term engagement from the school and its community. This area is also the furthest from residential areas, and this allows designs and work methods to be trialled well before they are occurring directly behind someone's back fence.

Four major stages of work are recommended:

- I. Warwick Rd to Sapar Landscapes (FY 2017/18)
- 2. Sapar Landscapes to Briggs Rd (FY 2018/19)
- 3. Briggs Rd to Poplar St Park (FY 2019/20)
- 4. Poplar St Park to Whitehill Rd (FY 2020/2I)

These stages are shown on the plan on the next page.

What time of year is best?

Major earthworks should ideally occur between July and October when there is the least chance of having a major storm that could cause damage and wash sediment downstream. Planting should be completed by late November to enable new plantings to make use of the warmth, sunlight and rainfall over the summer months.

