Visually Communicating Artificial Urban Wetlands

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Articles

Introduction

Urban wetlands in Australia are under threat, yet they provide benefits for climate change mitigation, pollution reduction, habitat provision, and socioecological connection. In what is now known as Sydney's inner south and inner west, wetlands were significant places maintained by Aboriginal peoples for millennia (Foster). The violent colonial history that shaped Sydney

unfolded along its extensive and dynamic wetlands and connecting waterways. Water was enclosed, drained, dammed, and channelled underground to service the city's growth. "Unproductive swamps" were filled in for factories and housing.

Today, in an era of unprecedented urban growth, wetlands are making a comeback, with urban renewal projects incorporating artificial systems into water-sensitive urban design with shallow, densely planted ponds that help filter water through physical and biological processes. Artificial wetlands in densely populated areas are increasingly recognised for their effectiveness in reducing the runoff volume and the level of pollutants before stormwater enters urban creeks, rivers and oceans. They are "a key technology in the design of water-sensitive urban centres" (Fitzgerald 171).

Although some Sydney wetlands are revered and protected without question, such as the Ramsar-listed Towra Point Nature Reserve, others are undervalued as urban ecologies. Green infrastructure such as wildlife corridors, verges, rain gardens, pocket parks, and artificial wetlands are not well understood as being both on Country and connected to infrastructure (pipes and drains), ecosystems (critters, plants, and groundwater) and leisure activities (pets, sports, walking, running, and being together). It has been pointed out that focussing on wetlands only as habitat for waterbirds or iconic species "creates an exclusionary environmental protection practice that can have adverse consequences for an ecosystem intrinsically connected to its surroundings, as wetlands are" (McDonald and Gillespie 3).

In this article, we examine an artificial wetland at Sydney Park, adjacent to the Green Square urban renewal site. Through a visualisation method we call "photo diagramming" (Jones et al.), we ask the question: how might visual communication play a role in helping to make artificial wetlands more legible as socioecological systems?

First, we offer a brief history of Sydney Park, also describing how the artificial wetlands were designed. Then, we introduce our photo diagram, which shows how artificial wetlands operate as contact zones between the human-centred and more-than-human needs of cities, generating the edges necessary for recombinant ecologies to thrive (Crosby et al.). Finally, we explore what we can learn from a visual appreciation of artificial wetlands in urban Countries that might translate to other artificial yet beneficial aspects of urban environments.

Artificial Wetlands

Constructed wetlands and artificial wetlands are used interchangeably, although "constructed" seems to be preferred in engineering literature and "artificial" is often used in public communications, such as informative signage. The interchangeability of these words regarding wetlands is significant to our argument about what wetlands can teach us about urban nature. Wetlands in the city are both artificial and constructed, challenging conventional ideas of nature in urban contexts. The ecologies they generate are recombinant in the sense that they emerge through human intervention.

Australian artist Tega Brain engineered an artificial wetland system to demonstrate this point. Coin Operated Wetland cycles water in a closed loop system and washed dirty clothes. Through the system, Brain visually explains how water, although often made invisible by the urban life it sustains, is constantly circulating in "natural" ways, even if the systems that support the circulation are engineered by humans, and arguably artificial.

Queer ecologies, which first emerged as a distinct framework in the mid-1990s (Seymour), can also contribute to enhancing distinctions between the artificial and the natural. Geographer Taylor Coyne describes the hybrid spaces of Sydney's swamps (wetlands) as queer watery ecologies: "low-lying areas typified by soggy sports fields, pond-dotted golf courses, parks intersected by stormwater canals, and remnant wetlands, swamps, marshes, and creeks. … Partially dry but not always fully wet – sit at the interface of the surface/sub-surface ecologies of the region" (Coyne).

In this article, we focus on a particular artificial wetland in a typical Sydney swamp, at Sydney Park, in Gadigal, Dharawal Country, to show how human-made infrastructure can be thought of as natural, how urban ecological systems are all in fact constructed, and how Country underpins it all.

Locating Sydney Park in Colonial History

> We walk to one boundary of the park, looking for a drain we have seen on historic maps, the Munni channel. From previous research on water stories of the area (Vanni, Ilaria and Crosby), we know this channel meets Shea's Creek, which then runs into the Cooks River, and that this connection is crucial to the design of the park's wetland system. A fenced-off area is clearly signed to keep us out, but a small concrete overpass, heavily decorated with graffiti, provides a viewing platform. There are workers in high-vis vests and knee-high gum boots. Their movement makes waves; clearing, hosing and flushing the water in the opposite direction to the flow of the channel.
>
> We ask, "Is this the Munni channel? Where does this water go?"
>
> They are friendly, but it is clear they are unsure, shrugging and shaking heads. "There was a sewage overflow," they reply. "It's not meant to happen, but sometimes it does. We are just here to fix that problem."

Sydney Park is a 44-hectare park located on sand dunes and wetlands Country between Kamay (Botany Bay) and War'ran (Sydney Cove). The Sydney Park Stormwater Harvest Scheme upgraded the park over two years and was completed in 2015. It is now an iconic, award-winning piece of green infrastructure ("Sydney Park Wetlands"). Dogs enjoy extensive off-leash areas; runners ascend the rolling hills; and children play in large playgrounds and learn to ride bicycles on gentle cycle tracks. A skate park, sports oval, outdoor fitness areas, and a city farm – all designed around a series of ponds.

To understand the ecological and social significance of Sydney's wetlands, we have to think back to how this Country was cared for before invasion, before the dredging and channelling that provided the hard surfaces the city was built on. Forest of turpentine and ironbark trees with swamps, marshes, and heath where Aboriginal people "hunted kangaroo on the grasslands here and fished and camped at the swamps, creeks and rivers that crisscrossed the area." (*Sydney Park: Kangaroo Ground to Brickpits | The Dictionary of Sydney*).

The watery pre-colonial landscape generated rich alluvial soil in the area. Some pockets were terraformed for gardens and orchards, and many areas became a significant source of clay in the 19th and 20th centuries. Brickworks remained operating until 1970. Like many brickworks sites in Sydney, the pits at Sydney Park were also used as a local tip (Dictionary of Sydney). Some of the decommissioned Bedford Bricks kilns are retained in the landscape of the park, a trend in

public space as "the chief form of memorialising the disappearing industrial history of Sydney" (Murray).

A Working Landscape in the Picturesque Style

In this section, we briefly describe how the wetlands intersect with urban renewal, building on colonial aesthetics. The artificial wetlands at Sydney Park were made between April 2013 and October 2015 ("Sydney Park Wetlands") and now function to manage the existing flood problems in the Munni Street catchment and ensure that "new development is compatible with the flood hazard and does not create additional flooding problems in other areas" (Cardno). In other words, to prepare for urban renewal.

In keeping with the urban renewal desire to create green, natural spaces in the city, the park updates principles of the picturesque in landscape design. This trend, developed in Europe in the eighteenth century, plays with ideas of artificially naturalistic landscapes, designed to mimic nature, and carefully planned to guide the appreciation of wildness (Brook). Design elements update the eighteenth-century picturesque into contemporary Sydney abound in the park. Viewing stations that shaped the viewer's experience by suggesting a precise point of view (Brook 171) become wetlands lookouts that invite park users to stop, contemplate, and read the explanation signs on wetlands critters. Variety, contrast, and irregularity are translated in the undulating terrain and planting of native species in different heights, textures, colours, and flowering patterns which create habitat for diverse water birds. The winding paths, sudden views, and contrasts between light and shadow of picturesque landscapes materialise in walkways through the wetlands that open into vistas framed by trees.

The Munni Street Stormwater System (Sydney Water System number 74) is the built infrastructure within the Munni Street Catchment, one of the three sub-catchments of the Cooks River Catchment. Nearly all of the Munni Street Catchment lies within the City of Sydney area. The catchment includes the suburbs of Newtown, Alexandria, Camperdown, and Erskineville and is roughly bounded by Sydney Park to its south. As mentioned in the vignette above, the Munni Street catchment discharges into Alexandra Canal through the concrete channel near Burrows Road.

Most importantly to flood management, the Sydney Park wetlands divert stormwater through underground pipes. When the water levels are high, water is drawn from the channel into the Sydney Park Wetlands.

According to [City of Sydney,](#) the wetlands also filter water through a pollutant trap and series of bio-retention beds; revitalise the park's wetland system to increase storage and improve water filtering; improve the landscape to create more recreation and play opportunities; connect wetlands via a picturesque series of water cascades; improve the footpath network; give dogs somewhere to cool off; provide information to visitors within the park about the water treatment and ecological function of the wetlands; and offer an artwork comprising a series of elevated terracotta channels that reflect the site's history and aerate and distribute water throughout the wetland system.

Following how the function and aesthetics of the wetlands intersect, we interviewed artist Jennifer Turpin about the design of the sculptural aspects of wetlands. Without using the words "artificial" or "constructed", she described the park as a "working landscape". Working with her

collaborator Mikaela, her concept was "cleaning the water … but in an artful way". They were interested in critters, infrastructure, water flow, plants, and people. "Let's provide something for birds, they can have baths and clean themselves, which they do", and "let's show people the water".

Analysing the goals of the City of Sydney, listening to the artists, and observing the wetlands themselves, we took up the challenge to show people the water through photo diagrams.

Interpreting the Wetlands: Photo Diagramming at Sydney Park

Our place-based ethnographic research (Vanni and Crosby) at the park was a foundation for the visualisation of the working landscape. Our brief was to make the wetlands present and legible. Photo diagrams are a technique that makes all manners of urban nature legible as socioecological processes. Our photo diagram visually communicates Sydney Park as a working landscape.

While there is no scope in this article to explain the whole process of making the photo diagram, it should be understood as an iterative process that works alongside photo documentation as a way to "move back and forth, observing, photographing, coding, editing and diagramming" (Jones et al.).

We begin with photo documentation (fig. 1). As a visual technique, photo documentation has a long history in the social sciences, as an analytical method to collect detailed changes in social, cultural, and ecological landscapes. For instance, Charles Sucher, one of the pioneers in the use of photo documentation as a research method, captured the effects of gentrification on the urban environment. Suchar developed a technique including shooting scripts, extensive fieldnotes attached to each image, and coding to use photography as evidence of change. Suchar describes this process as iterative, as a going back and forth between shooting and research questions "to pull together and categorize a series of otherwise discrete events, statements, and observations which they identify in the data" (Suchar 38). In this way, Suchar grounds "visual information in the evolving conceptual understanding of subject matter" (Suchar 52).

We also adopt an iterative process using various digital cameras and phone cameras. Over more than five years of visiting Sydney Park, individually and together, we photographed and tagged (as a form of coding) thousands of photographs to frame and record the changes in the urban landscape of Sydney Park (fig. 1). We collated, shared, and sorted these photographs, letting categories emerge as a way of organising what we had seen: critters; infrastructure; leisure; plants; signs; water flow, picturesque elements.

2020–2024
SYDNEY PARK

CRITTERS

INFRASTRUCTURE

LEISURE

PLANTS

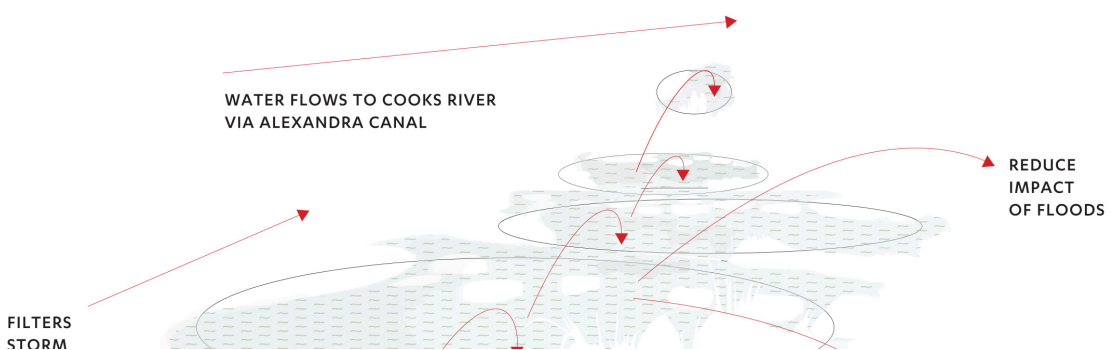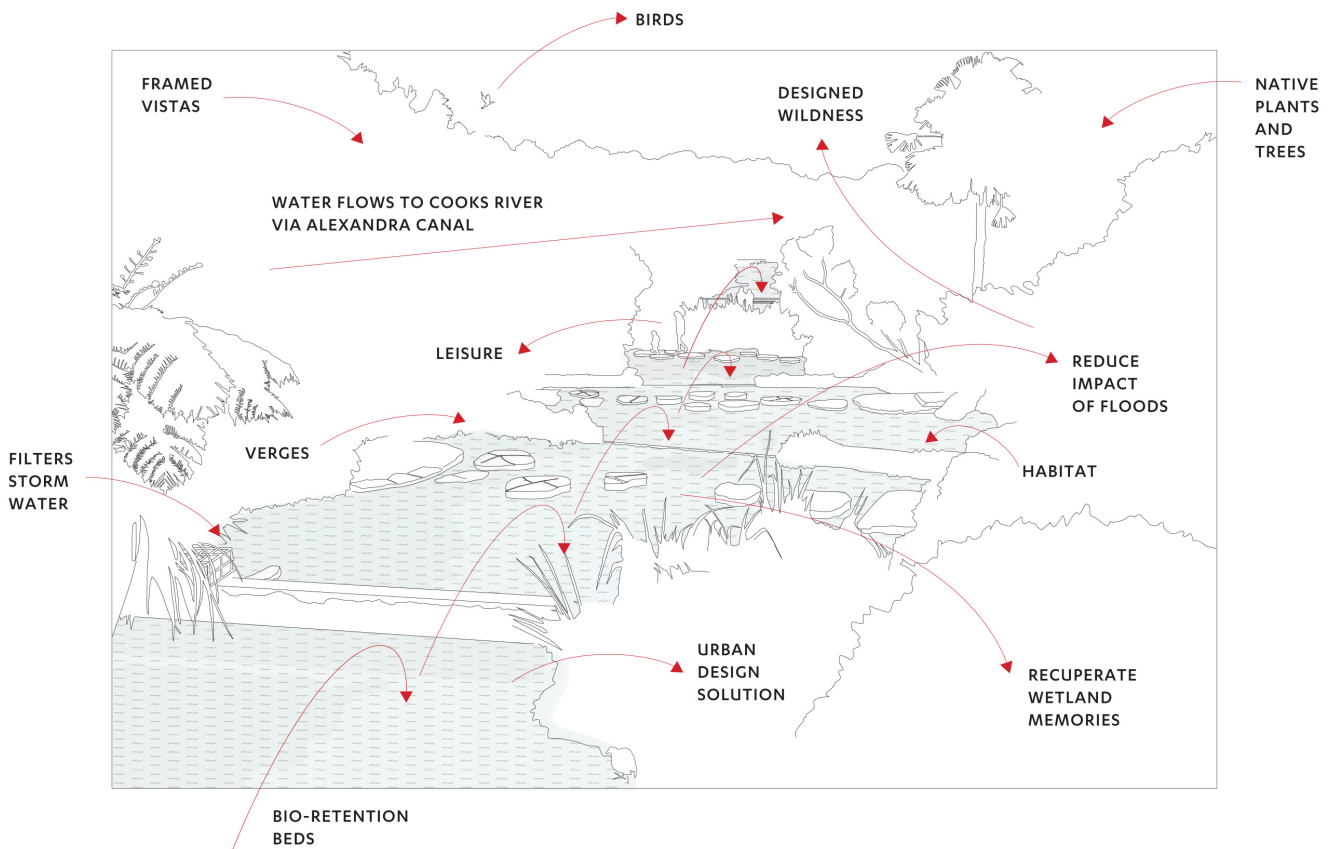

SIGNS

WATER FLOW

PICTURESQUE ELEMENTS

Fig. 1: Photo documentation: a sample of hundreds of photographs to frame and record the artificial wetlands at Sydney Park.

From the hundreds of photos taken during this iterative photo documentation, we select those that better capture each category. From these, we then make a photo diagram (fig. 2), using saturation and desaturation to highlight certain aspects, arrow and line drawings to further enhance the leading elements of the image: in this case, showing how a naturalistic-looking pond is a designed working landscape that invites park goers to experience the park through the lens of picturesque "wildness".
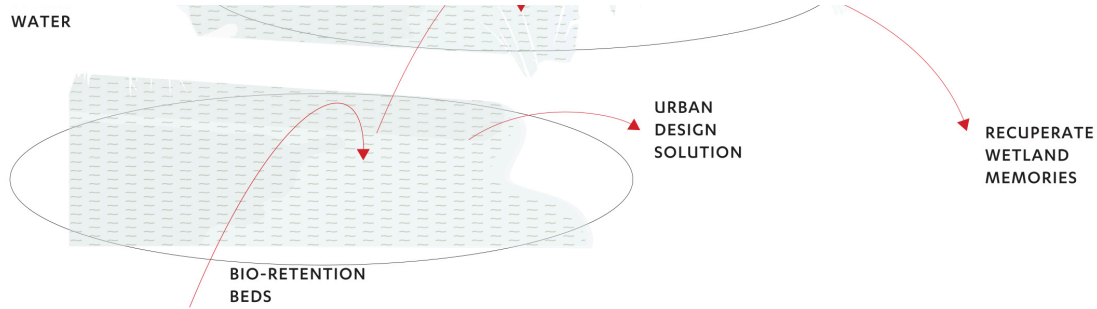
Fig. 1: Photo documentation: a sample of hundreds of photographs to frame and record the artificial wetlands at Sydney Park.

BIRDS

FRAMED
VISTAS

DESIGNED
WILDNESS

NATIVE
PLANTS
AND
TREES

WATER FLOWS TO COOKS RIVER
VIA ALEXANDRA CANAL

LEISURE

REDUCE
IMPACT
OF FLOODS

FILTERS
STORM
WATER

VERGES

HABITAT

URBAN
DESIGN
SOLUTION

RECUPERATE
WETLAND
MEMORIES

BIO-RETENTION
BEDS

WATER FLOWS TO COOKS RIVER
VIA ALEXANDRA CANAL

REDUCE
IMPACT
OF FLOODS

FILTERS
STORM

Fig. 2: Photo diagram: one of the most complex sites in the park is a series of ponds and waterfalls flanked by trees and rushes and dotted with stepping stones. Rather than a lookout, these steps function as an experience station, inviting people to literally step into the ponds and appreciate the designed wildness of the park from the thick of things rather than from a privileged point of view. The diagram shows the leading elements of this working landscape, revealing how the perceived wildness enacts precise functions, such as recuperating wetlands ecological memories, reducing flood risks, and filtering water through bioswales.

Conclusion

Few would dispute that water-sensitive urban designs like the artificial wetlands at Sydney Park contribute to sustainability, liveability, and the transition of Sydney to a water-sensitive city (Fitzgerald; Wong).

Bringing these positions together, we have created a photo diagram that seeks to communicate that although they are artificial, Sydney Park wetlands are an inseparable part of the urban green infrastructure, a habitat for essential plants and animals, and valuable sites of leisure for people. Furthermore, the wetlands should be cared for as a Country.

We are focussed on visibility and seek to evoke the connections that artificial wetlands can make between people, infrastructure, nature, and climate. By working across "wet" and "land" and drawing out the leaky trajectories of waterways in the city, our photo diagram of Sydney Park offers an alternative to the homogeneity of visual representations of green infrastructure. It also helps us remember that an urban park is not only a contained and protected parcel of land but a leaky and connected piece of green infrastructure.

By challenging the perceived artificiality of these wetlands and remembering that all of Sydney is built on unceded Aboriginal land and water, we contribute a way to understand such projects as made up of watery trajectories that go beyond the boundaries of the park, and off the map of suburb boundaries.

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