



CARING FOR THE NEPEAN RIVER:

A guide for the Camden community

INTRODUCTION

The Nepean River is one of the major biodiversity corridors within the Camden local government area (LGA), flowing through the suburbs of Spring Farm, Camden South, Camden, Ellis Lane and Cobbitty. The Nepean River biodiversity corridor is significant, as it supports a wide diversity of plants, animals, threatened ecological communities, and threatened plant species.

While much of the original native vegetation within the Camden area has been previously cleared or altered to accommodate agriculture or residential development, there are still large patches of remnant vegetation along the Nepean River corridor and it is very important to protect this remaining vegetation.

The remnant vegetation found in the corridor is located within different land zonings with permitted uses ranging from agricultural and industrial production, residential housing, recreation and environmental conservation. Camden Council is responsible for managing remnant vegetation within public land, however, the majority of vegetation is found on privately owned land.

This guide summarises the management actions Camden Council will implement to deliver long term protection and management of the biodiversity values within the corridor, as well as provide private landowners with important information about the bushland found on their property and what key actions can be undertaken to protect the environmental values of this land.





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WHERE IS THE NEPEAN RIVER BIODIVERSITY CORRIDOR?

The Nepean River is located in the south-west and west of Sydney and extends through the Camden LGA for approximately 29 kilometres. It generally flows in a north-westerly direction through the suburbs of Spring Farm, Camden South, Camden, Grasmere, Ellis Lane and Cobbitty, and forms part of the boundary with Wollondilly Shire LGA to the west. The river itself is generally uniform throughout the Camden LGA, being fairly constant in width and depth, with a low flow rate, few riffles, and sparse aquatic vegetation.

Land within the Nepean River corridor is subject to a range of different uses, including agricultural and industrial production, environmental conservation, public recreation, residential development and transport infrastructure. Much of the corridor is subject to ongoing pressures from stock grazing and irrigated cropping. Rapid urbanisation has also contributed to catchment wide impacts on the corridor. A small portion of the corridor is within Council ownership and consists of recreational land and environmental conservation zones that are concentrated in the southern part of the LGA. The remaining corridor is under private ownership and adjoins land that is used for agriculture and is subject to ongoing pressures from stock grazing and irrigated cropping.

Recreational land use within the corridor is largely restricted to the section between Elizabeth Macarthur Reserve and Cowpasture Bridge. This section features several bushland reserves, open greenspace, parks, and the Nepean River Cycleway, which all provide passive recreational opportunities for the community.

This vegetation is generally broader and in better condition where land zoning reflects permitted uses that are compatible with biodiversity conservation. For example, there are larger patches of remnant vegetation present in the southern sections of the corridor where the predominant land uses are environmental conservation and recreation. This is in contrast with the northern sections of the corridor where riparian vegetation is generally thinner and offered less protection, due to ongoing agricultural uses and residential development.

The location of the Nepean River corridor within the LGA is illustrated in Figure 1.

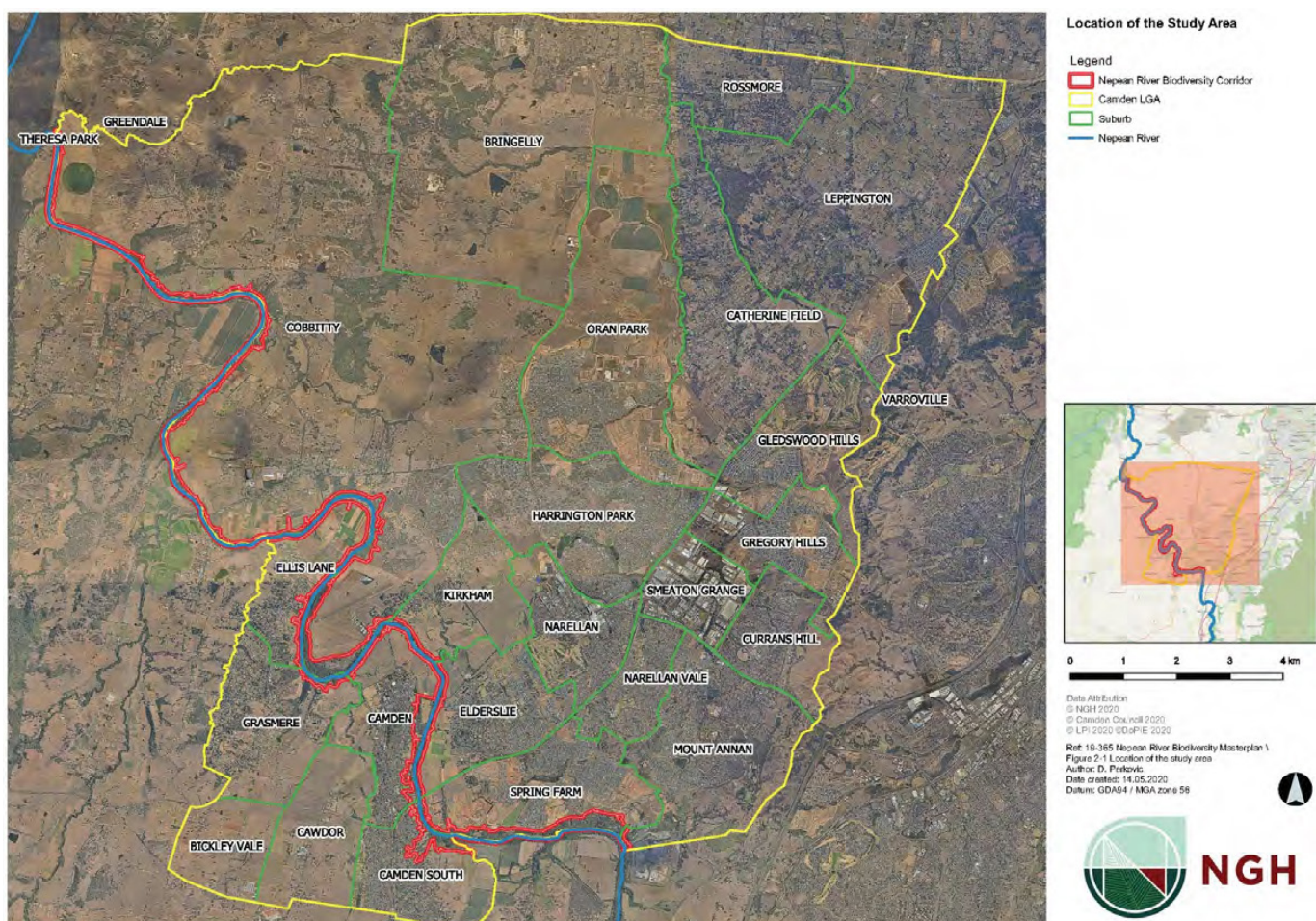


Figure 1 – Map indicating the location of the Nepean River Biodiversity Corridor within the Camden local government area

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WHY IS THE NEPEAN RIVER CORRIDOR IMPORTANT?

Most native vegetation along the corridor has been previously cleared to accommodate agricultural production. However, a thin and largely continuous strip of remnant vegetation persists along the banks and riparian zone.

Surveys carried out in April 2020 identified a total of 156 plant species within the Nepean River corridor, including 95 native species (61 per cent) and 61 exotic species (39 per cent). Two of these species are threatened, the Camden White Gum (*Eucalyptus benthamii*), and Brown Pomaderris (*Pomaderris brunnea*), both of which are recognised as vulnerable under both state and Commonwealth legislation. Eight threatened animal species were sighted in the Nepean River corridor, including the critically endangered Swift Parrot (*Lathamus discolour*).

The Nepean River corridor contains Cumberland Plain Woodland, River-flat Eucalypt Forest and Elderslie Banksia Scrub Forest, which are vegetation communities listed as Critically Endangered under the NSW Biodiversity Conservation Act 2016 (BC Act) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The Nepean River plays an important role in the region, acting as a biodiversity corridor that connects larger habitat patches, allowing movement of native plants and animal that cannot easily move through urban environments. The preservation and enhancement of this corridor is important, as larger corridors are able to support a greater number of species and larger populations.

The Nepean River biodiversity corridor supports a number of threatened plant and animal species highlighted in Figure 2. The river channel provides important connectivity for mobile fauna such as birds, microbats and the threatened Grey-headed Flying-fox which forage along it. Mature canopy trees along the corridor support arboreal mammals such as the Sugar Glider, Brushtail Possum, and Common Ringtail Possum. Numerous hollow bearing trees were identified that provide important roosting and breeding habitat for hollow-dependent species including parrots, arboreal mammals, and microbats.

The Nepean River is also known to support a range of more than 50 fish species and is considered overall to be in “good” condition for freshwater fish communities. It is one of the few waterways in Sydney with this rating, with most being fair or poor. Several Platypus sightings have also been reported within the Nepean River in the last few years.

Figures 3 to 5 show the distribution of vegetation communities throughout the northern, central and southern sections of the Nepean River biodiversity corridor, as well as other interesting features.



Camden White Gum



Brush Tailed Possum



Brown Pomaderris



Ring Tailed Possum



Figure 2: Significant plant and animal species supported by the Nepean River biodiversity corridor



KEY

- 1 Brown Pomaderris (*Pomaderris brunnea*) – Endangered
- 2 Camden White Gum (*Eucalyptus benthamii*) – Vulnerable
- 3 Grey-headed Flying Fox (*Pteropus poliocephalus*) – Vulnerable
- 4 Gang-gang Cockatoo (*Callocephalon fimbriatum*) – Vulnerable
- 5 Sugar Glider (*Petaurus breviceps*) – Protected
- 6 Swift Parrot (*Lathamus discolor*) – Endangered
- 7 Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – Vulnerable
- 8 Cumberland Plain Land Snail (*Meridolum corneovirens*) – Endangered
- 9 White-bellied Sea Eagle (*Haliaeetus leucogaster*) – Vulnerable
- 10 Platypus (*Ornithorhynchus anatinus*) – Protected
- 11 Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) – Vulnerable

SPECIES SPOTLIGHT: PLATYPUS



While the Platypus (*Ornithorhynchus anatinus*) is not currently listed as threatened under any state or commonwealth legislation, it is an iconic animal for the Camden community. Once common in the area, the effect of human activities has impacted the river and seen a decline of the Platypus.

Camden Council adopted the Platypus as its logo in 2005 to acknowledge that healthy waterways are an essential component of Camden's natural environment, as Platypus are an important indicator of water quality.

What is Council doing to help the Platypus?

Council is committed to restoring the waterway health of the Nepean River, so Platypuses can return to their natural habitat. A prioritised action for Council is to implement a Platypus monitoring program to better understand the population within the Camden LGA.

Detecting species, particularly in an aquatic environment, can be difficult, time consuming and often highly invasive. Platypus are also active during twilight and in the night, when visual observations are difficult. Analysis of environmental DNA (eDNA) is a relatively new, quick and non-invasive method for detecting species such as Platypus. As the name suggests, eDNA refers to the genetic material that an organism leaves behind in its environment.

Council commenced monitoring of the Platypus within the Nepean River in February 2021, as this is a particularly active period in their lifecycle while juveniles are leaving the burrow. The presence of Platypus can be detected by collecting water samples which are then sent to a laboratory to be analysed for eDNA markers. Council's survey will utilise eDNA technology to determine any traces of Platypus, Macquarie Perch (threatened fish species) and the invasive fish European Carp within the Nepean River.

For more information on the results of the Platypus monitoring program, visit Council's website.

www.camden.nsw.gov.au/environment/biodiversity/native-animals/platypus/



The Platypus is an indicator of sustainability and a healthy waterway.

What can landholders, local residents and visitors do to help the Platypus?

- Don't use opera house yabby nets as Platypuses can get caught in the trap and drown. Also make sure you take your fishing lines and rubbish with you – don't discard it in the water or nearby.
- Plant native plants along the stream bank, it will protect the banks and provide areas to live.
- Stop pollution from your property entering the stormwater system, such as detergents, fertilisers, pesticides and rubbish.
- Don't disturb Platypus if you see them.
- Clean up streams by removing broken bottles and rubbish
- Keep your cats inside, especially between dusk and dawn.
- Keep your dogs on a leash if walking them near platypus habitat and pick up after your dog (so this does not pollute the stormwater system).



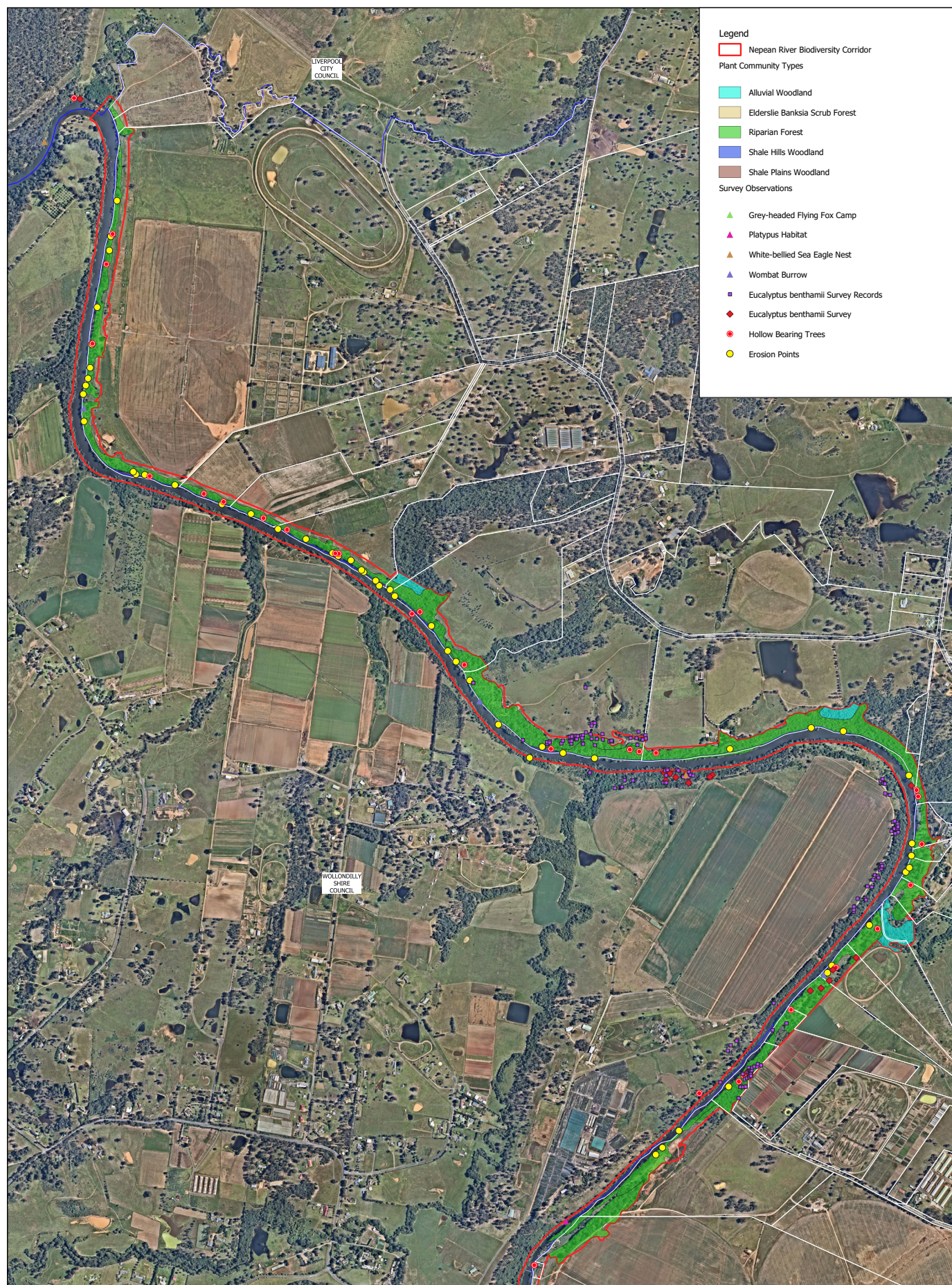


Figure 3: Map showing the distribution of vegetation communities throughout the northern section of the Nepean River biodiversity corridor.

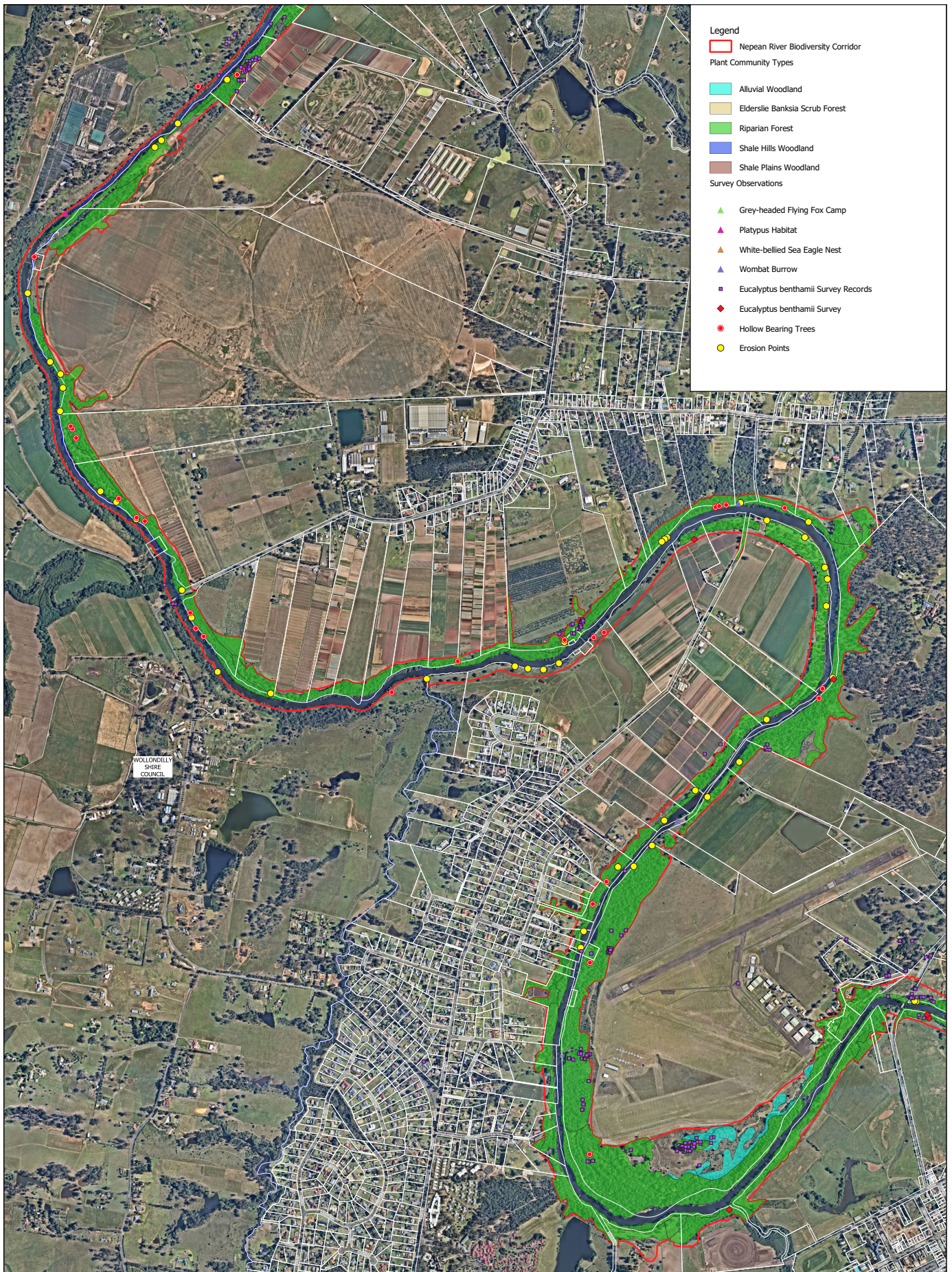


Figure 4: Map showing the distribution of vegetation communities throughout the central section of the Nepean River biodiversity corridor.

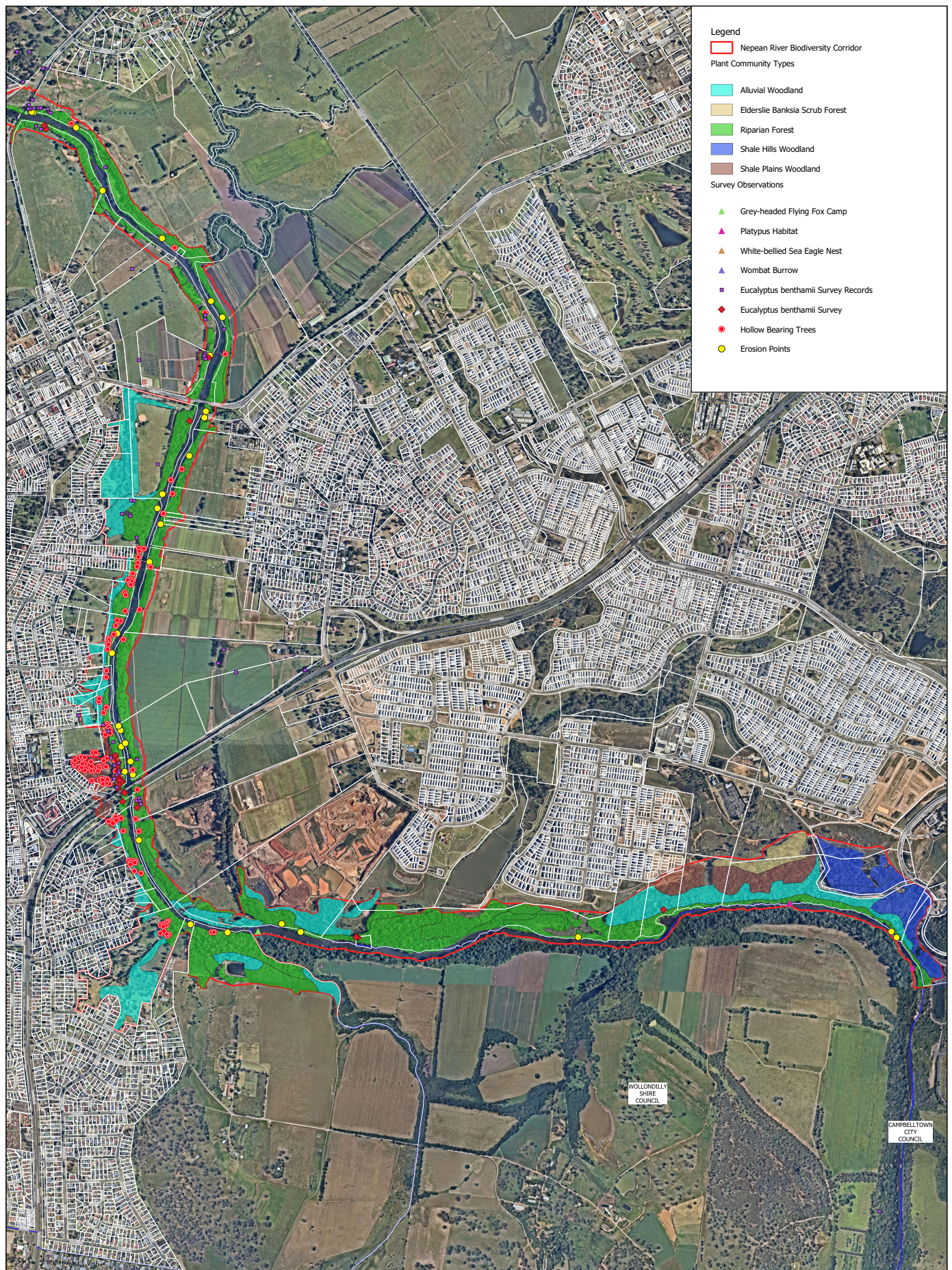


Figure 5: Map showing the distribution of vegetation communities throughout the southern section of the Nepean River biodiversity corridor.

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WHAT CAN WE DO TO CARE FOR THE NEPEAN RIVER?

Our everyday activities and habits can all impact the health of the Nepean River and other waterways within the Camden LGA. We can all make a difference and care for the Nepean River biodiversity corridor.

Improving the biodiversity values of the corridor will be maximised by working in partnership with several important stakeholders that all have a role to play, including local landholders, recreational users, NSW Government agencies, adjoining councils and the local community.

The five main threats to the corridor are outlined below, with actions that Camden Council will implement to address the threats, as well as actions that private landholders, residents and visitors can do to care for the biodiversity corridor.

Specific support and resources for landholders that are currently offered by Camden Council and other Government agencies, including Greater Sydney Local Land Services (GSLLS), are also outlined below to help you protect and enhance the biodiversity values in the Nepean River corridor.

As a landholder, local resident, or a recreational user of the Nepean River corridor you can use this guide to identify recommended management actions and resources that are relevant and practical to implement on your property or when you are visiting the corridor.

1. Weed infestation (both terrestrial and aquatic)

The invasion of environmental weeds is one of the most significant threats to biodiversity within the corridor.

Weeds impact native vegetation by degrading areas and providing increased competition for native species. In most cases, weeds outcompete native plants for resources and can take over an area. Dense infestations of woody weeds such as African Olive, Honey Locust, Privet and Willow prevent native flora from re-establishing along the riverbanks.

Aquatic weeds are also a significant threat and can grow rapidly where low flows, elevated nutrient levels and warm temperatures coincide.

Council will:

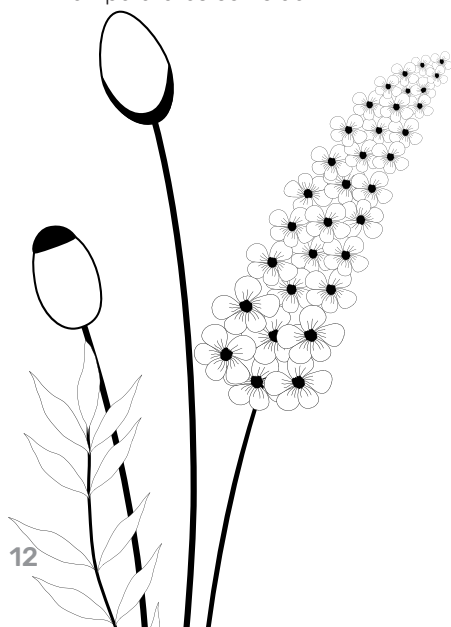
- Remove weeds on public land along the corridor, prioritising work in areas of threatened species habitat and where threatened species are known to occur;
- Prepare and implement a natural areas program incorporating weed management for priority reserves including Chellaston Reserve, Macquarie Reserve, Belgenny Reserve and Spring Farm Bushland Corridor;
- Work with other landowners to coordinate weed control to maximise effectiveness;
- Support local landowners by providing and promoting weed management information and workshops; and
- Continue to implement the NSW Weeds Action Program (WAP) to control priority aquatic weeds along tributaries of the Nepean River in collaboration with Campbelltown and Wollondilly Councils.

Local landowners can:

- Prepare a weed control plan based on the weeds on your property that looks to control and prevent the spread of environmental weeds;
- Work with neighbouring properties to coordinate weed management activities for maximum impact;
- Clean machinery and vehicles that have been in weed infested areas to prevent the spread of weeds; and
- Talk to GSLLS to see if there are any small landholder grants available to assist with weed removal on your land.

Local residents and visitors can:

- Plant local natives in their gardens to provide additional habitat;
- Remove weeds and avoid planting known environmental weeds to prevent weeds escaping into bushland areas; and
- Avoid planting attractive exotic plants and known common garden escapes, such as Agapanthus, Cocos Palm and White Arum Lily. For a guide to garden escapes check out the responsible gardening guide developed by the Sydney Weeds Committees (sydneyweeds.org.au).



2. Invasion by pest fauna

Terrestrial and aquatic pest animals are found within the corridor and include deer, feral goats, cats, rabbits, foxes, wild dog, feral pigs and carp. These pest species can have significant impacts by outcompeting native species for resources, harming native fauna, spreading weeds and degrading land through grazing and trampling. Pest animals can also harm livestock and small domestic animals like chickens. Carp can also have a significant impact on water quality by stirring up debris and sediment from the river channel and outcompeting native fish species.

Council will:

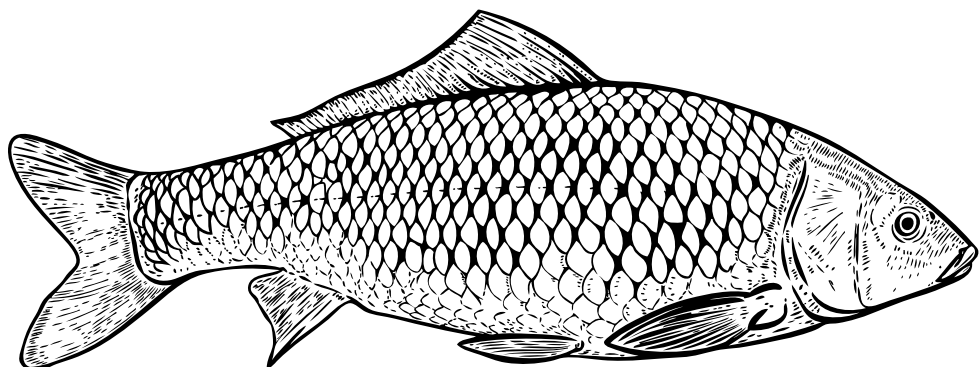
- Undertake pest fauna monitoring to inform a pest fauna management strategy for public land;
- Manage pest fauna on public land within the corridor; and
- Work with other landowners and stakeholders to coordinate pest fauna control for maximum impact.

Local landowners can:

- Contact GSLLS to determine what options and assistance are available for you;
- Develop and implement a pest control strategy for your land; and
- Participate in GSLLS training sessions and programs to control pest fauna on your property, and coordinate work with neighbouring properties to maximise impact.

Local residents and visitors can:

- Keep your cat in overnight to prevent it harming native wildlife. Cats can roam up to three kilometres each night and are very damaging to our native wildlife, including birds and animals.
- House pet rabbits in a secure cage or hutch to prevent escape and ensure you keep vaccinations up to date.
- While it can be fun to feed wildlife it can be damaging to the health of wild animals, and also encourage higher populations of pest animals including Indian Myna birds, exotic ducks, mice and rabbits.



3. Erosion of riverbanks

Erosion is a natural process in a river system, however, rates of erosion have increased due to human impacts including vegetation removal from the riverbank and stock access to the Nepean River. Bank erosion leads to decreased water quality and loss of habitat for native species such as platypus.

Council will:

- Target bank restoration and stabilisation works at identified priority erosion points. This will include staged woody weed removal and revegetation of previously cleared banks to minimise further bank erosion;
- Investigate additional formal public access points to the Nepean River and limit access to unofficial tracks; and
- Implement a bank erosion monitoring program to determine effectiveness of bank restoration and stabilisation works and adapt as required.

Local landowners can:

- Limit/buffer stock access to riparian vegetation and waterways to prevent further bank erosion.

Local residents and visitors can:

- Access the Nepean River only from formal public access points.



4. Water quality

Water quality can be negatively impacted by pollutants coming from a wide variety of sources. These sources can sometimes come from specific points, but more often small amounts of pollutants, including sediment, oils, fertilisers, chemicals and organic waste, are picked up from a large area during rainfall events and washed into our waterways. When combined together these pollutants can have a big impact on local water quality in the Nepean River.

Sources of pollutants include:

- Agricultural runoff;
- Stormwater outlets;
- Carp (invasive fish) stirring up debris and sediment from the river channel;
- Bank erosion; and
- Organic matter from deciduous weeds, such as Willows.

Council will:

- Continue to implement Council's water quality monitoring program for the Nepean River and other waterways and implement management actions to improve the quality of inflows;
- Enhance existing riparian vegetation to stabilise the riverbank and prevent further erosion at identified priority erosion points;
- Investigate the installation and regular maintenance of stormwater treatment devices to control pollution from urban areas;
- Promote Water Sensitive Urban Design principles for all new urban developments within the Nepean River catchment; and
- Work with upstream councils to support their water quality management actions.

Local landowners can:

- Minimise fertiliser/manure runoff into the Nepean River through implementation of erosion and sediment control measures on riparian land, such as sediment fences, sediment fence isolation barriers; and
- Look to use natural alternatives to pest control chemicals.

Local residents and visitors can:

- Reduce your use of fertilisers, use slow release fertilisers that are less soluble in water, or look to use natural fertiliser alternatives. It's also important to check the weather before you apply to avoid periods of rainfall;
- Wash chemicals or paints over a sand filter on your lawn instead of down the drain;
- Council has regular chemical clean out events where you can safely dispose of old paints, fertilisers and pesticides free of charge;
- Stop dirt, leaves and grass clippings from entering drains by putting these in your green waste bin;
- Sweep hard paths and driveways instead of hosing debris into stormwater drains;
- Wash your car on the lawn as the grass will help trap and uptake any detergent runoff and prevent it from washing down the gutter and drain; and
- Keep the river clean and healthy by not littering. Better yet, why not safely pick up litter, especially plastic bags, rubber bands or hair ties and put them in the bin. Rubbish can get washed into rivers and animals such as the Platypus, can get tangled in them.



5. Native vegetation clearing and habitat loss

Native vegetation within the corridor is restricted to a narrow strip that is approximately 300 metres wide at its broadest and less than 100 metres wide on average. This is the result of extensive pre-1840 land clearing, subsequent agricultural intensification, and recent urban development. The remaining vegetation is subject to a high degree of edge effects due to its linear shape and is vulnerable to incremental clearing, dieback, and loss of habitat due to bank erosion.

Revegetation plays an important role in helping to reconnect vegetation and creating more diverse and resilient habitat. Revegetation can be undertaken by allowing natural regeneration to take place, undertaking infill planting amongst existing remnant bushland, or more extensive planting projects that will work to establish new bushland. Revegetation can help our native wildlife, by creating stepping stones within the landscape which link patches of bushland with surrounding areas.

Council will:

- Undertake staged bush regeneration of riparian vegetation along the corridor. This work will be prioritised around areas with threatened flora present;
- Implement native vegetation and threatened flora monitoring program to assess progress of bush regeneration works;
- Include interpretive signage in publicly accessible natural areas to explain and celebrate biodiversity values within the corridor;
- Work with the local Aboriginal community, landowners, community groups, and students to deliver best practice management in the priority conservation lands, and to identify other opportunities for involvement in the recovery program; and
- Plan and implement a public education program for local residents and adjoining landowners to promote biodiversity values within the corridor and encourage and support environmentally sustainable land management practices.

Local landowners can:

- Contact GSLLS to see if there are any small landholder grants available to assist with weed removal and revegetation on your land;
- Rehabilitate waterway frontages by removing weeds and revegetating the riverbank with native species; and
- Identify and fence off areas of high value vegetation and areas for revegetation and regeneration.

Local residents and visitors can:

- Revegetate areas of your property or create a small native garden with native plant species suitable for the Camden climate. Contact Council for information about appropriate native plant species for your property, or refer to Council's Native Garden Guide for additional information'
- Install small habitats features such as rock gardens for reptiles, installing birdbaths, creating a frog hotel or bee hotel are great ways to improve the biodiversity of your garden and help the local wildlife;
- Check out Council's Connect with Nature content for activity guides and instructions on how to create a habitat garden; and
- Take advantage of Council's Native Plant Giveaway held each year at Picnic in the Park (in September) as well as other programs including the 'Free Tree Giveaway' by the NSW Government.





FINANCIAL INCENTIVES, TOOLS AND RESOURCES

There are a range of resources and tools available to landholders to help protect and enhance biodiversity within the Nepean River biodiversity corridor through technical advice and/or financial assistance. This section aims to provide a list of resources that members of the community can access. Where possible, neighbouring landholders are encouraged to seek advice and coordinate efforts to efficiently reduce threats and improve biodiversity.

a. Biodiversity Stewardship Agreements

The NSW Government has established a market-based incentive scheme to encourage the conservation of land with biodiversity values called the Biodiversity Offsets Program. Landholders can enter into Biodiversity Stewardship Agreements (BSA) under this program to conserve their land, while also being able to generate and sell biodiversity credits.

BSAs are voluntary agreements made between the Biodiversity Conservation Trust and a landholder to permanently protect and manage an area of land to improve its biodiversity values. The credits generated can then be sold to developers (to offset development), the Biodiversity Conservation Trust and other interested parties. Some of the money generated must be used to fund the ongoing management of the land, however the sale may also generate a profit for the landowner.

To find out if the Biodiversity Offsets Program might be suitable for your property you can visit the Biodiversity Conservation Trust website at bct.nsw.gov.au

b. Greater Sydney Local Land Services

Unfortunately, not all properties within the Nepean River corridor are suitable for BSAs due to the small size of the property, with properties generally required to be several hectares in size to be considered suitable.

If your property is a small block with remnant native vegetation, there are other avenues of technical advice and financial assistance available to you.

Greater Sydney Local Land Services (GSLLS) is a regional government body providing advice and, where appropriate, funding assistance for landowners in bushland restoration, biosecurity and sustainable agriculture.

GSLLS is available to assist landholders on matters including:

- Pest and weed control methods;
- Bushland and waterway restoration and assistance;
- Farm biosecurity;
- Whole-farm planning;
- Sustainable agriculture; and
- Management of soil, water and ecosystems.

GSLLS run a range of programs and events that may be of interest, including the Menangle Fox Campaign and the Small Farms Network. To find out more about their programs and possible grant funding contact GSLLS directly on 4724 2100.





Little Sandy Bridge photo by Long Huang



FOR MORE INFORMATION

You can find out more about the programs and resources available to assist you in managing your land by visiting the links provided below:

Greater Sydney Local Land Services

greater_sydney.lls.nsw.gov.au

1300 795 299

admin.greatersydney@lls.nsw.gov.au

- **Grants and funding**
greater_sydney.lls.nsw.gov.au/our-region/financial-assistance
- **Education and training**
greater_sydney.lls.nsw.gov.au/resource-hub/training
- **Greater Sydney Regional Strategic Weed Management Plan**
[Greater-Sydney-Regional-Weed-Mgmt-Plan-FINAL-Sept-2019.pdf](#) (nsw.gov.au)

Camden Council Resources

camden.nsw.gov.au

4654 7777

mail@camden.nsw.gov.au

- **Local Biodiversity Strategy for Camden Local Government Area**
camden.nsw.gov.au/assets/pdfs/Council/Plans-and-Strategies/Camden-Council-Local-Biodiversity-Strategy.pdf
- **Sustainability Strategy for Camden Local Government Area**
Camden.nsw.gov.au/environment/sustainable-living/sustainable-council/
- **Native Garden Guide**
camden.nsw.gov.au/assets/Uploads/Camden-Native-Garden-Guide.pdf
- **Connect with Nature**
Camden.nsw.gov.au/environment/biodiversity/connect-with-nature/
- **Cobbitty Hills Landholder Guide**
Camden.nsw.gov.au/assets/uploads/Cobbitty-landholder-guide.12pp.pdf

Biodiversity Conservation Trust

bct.nsw.gov.au

1300 992 688

info@bct.nsw.gov.au

- **Biodiversity Stewardship Agreements for Landholders**
bct.nsw.gov.au/sites/default/files/2018-10/offset_BSA_brochure.pdf
- **Voluntary Conservation Agreements**
bct.nsw.gov.au/cards/apply-voluntary-agreement
- **Conservation Partners Grant**
bct.nsw.gov.au/cards/apply-conservation-partners-grant

Miscellaneous

- **Weeds in Australia**
environment.gov.au/biodiversity/invasive/weeds/
- **Bushland Weeds of the Sydney Region**
aabr.org.au/bushland-weeds-of-the-sydney-region/
- **Garden Escapes & Other Weeds in Bushland and Reserves: A responsible gardening guide for the Sydney Region**
Sydneyweeds.org.au/wp-content/uploads/2018/03/SWC_GardenBooklet_WEB_VERSION.pdf



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