

Superb Fairy-Wren Habitat in Glebe & Forest Lodge



Photo: Noel Luff COG

**a community based
conservation project**

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This project is an initiative of
The Glebe Society



supported by the City of Sydney's
Environmental Grants Program



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Executive Summary

Superb Fairy-wrens are small native birds that are found throughout south-eastern Australia, given suitable habitat. Members of The Glebe Society, and other residents of Glebe and Forest Lodge, have become concerned that the numbers of these birds are in decline in these suburbs, and The Glebe Society was successful in obtaining funding from the City of Sydney Environmental Grants Program for a program aimed at raising community awareness and for conservation of these birds in Glebe and Forest Lodge.

To date, this project has held community-based surveys of Superb Fairy-wrens in Glebe and Forest Lodge, and a workshop to provide community members with information about the habits and habitats of these birds. Although further research would be required to determine trends in population and distribution of Superb Fairy-wrens in Glebe and Forest Lodge, anecdotal evidence indicates that it is likely that their numbers are in decline, particularly over the past 5 years.

This report, as a part of the project, discusses the surveys and their results, Superb Fairy-wren habitat requirements, and offers recommendations and a conservation plan for the sustained presence of Superb Fairy-wrens in Glebe and Forest Lodge.

Habitat is the key to the conservation of any species. Superb Fairy-wrens require safe, sheltered habitat, and opportunities to forage for insects and to breed. Safe habitat can be achieved by following particular landscaping practices, including selection of suitable plants, and avoidance of unsuitable plants and inappropriate landscaping practices (that may be promoting habitat for predatory and aggressive bird species). Connection of suitable areas of habitat can allow for female dispersal and establishment of new family groups. Opportunities exist in Glebe and Forest Lodge to retain, enhance and create suitable Superb Fairy-wren habitat on both private and public land. Opportunities also exist for the community to become involved in long term monitoring of Superb Fairy-wren populations in the area.

While the Superb Fairy-wren is not listed as threatened or endangered on a state or national scale, without community awareness and involvement and awareness and positive actions by public land managers in the area, it is possible that this species will become locally extinct.

1.0 Introduction

Sydney is a city rich in bird life, with approximately 400 of Australia's 800 bird species (approx.) being recorded in Sydney and along its coastline since 1980. Landscapes, and consequently biodiversity and bird species populations and distribution within the Sydney Basin, have changed considerably since white settlement.

The Australian Museum has compared records of birds found in Sydney in 1900 with those found in 2000. Thirty-five bird species present in Sydney before 1900 are no longer seen, but 65 species that were not represented in early Museum collections are now common¹. Some species are declining, especially small birds, and some species are increasing in numbers, and becoming pests, or threats to the survival of other birds.

The Museum's study found that generally, there are lots more bigger birds, including:

- ✦ lots more parrots (and more types of parrots),
- ✦ more meat-eating birds,
- ✦ more fruit-eating birds, especially those attracted to small soft fruits,
- ✦ more larger honeyeaters, especially larger honeyeaters and the very aggressive Noisy Miner,
- ✦ more birds introduced from other countries, and
- ✦ a lot less smaller birds, and fewer types of smaller birds.

These changes in Sydney's bird life are no exception in Glebe. A number of residents have been concerned about a perceived decline in small birds in Glebe, in particular the Superb Fairy-wren, and The Glebe Society has obtained funding from the City of Sydney's Environmental Grants Program for a project aimed at community education and habitat conservation for Superb Fairy-wrens in the Glebe-Forest Lodge area.

Part of this funding was granted for the engagement of a consultant to research and map the current status of Superb Fairy-wrens in the project area and to provide a report which will include recommendations to the City of Sydney (and other land managers such as Metro Light Rail company) for the conservation and management of the Superb Fairy-wren in Glebe.

One of the main objectives of this project is to engage the community in actively

¹ History of Sydney's Birds Fact Sheet. *Birds in Backyards* website. Date accessed: 05/11/07.
URL: <http://www.birdsinbackyards.net/spaces/history-sydney.cfm>

participating in the conservation of Superb Fairy-wrens in Glebe and Forest Lodge. "As we remove more and more natural vegetation and as our climate changes, urban habitats are going to become increasingly important for many birds. When combined, domestic gardens are one of the largest patches of vegetation left in manmade landscapes. Therefore, they have the huge potential to be important bird conservation locations. However, our gardens are not always friendly to birds. We expose them to a wide range of potentially harmful disturbances and habitats that provide few resources." ²

Raising community awareness and fostering community involvement at a local scale is an excellent approach to urban bird conservation, and involving residents in retention and creation of habitat is essential to the persistence of small bird species in metropolitan areas.

The Superb Fairy-wren *Malurus cyaneus* is small brown bird endemic to south-eastern Australia. Birds are 11-14 cm long from beak to tail, with a wingspan of 12.5 to 16.5 cm, and weigh 9-12 grams. Superb Fairy-wrens are a sedentary species which congregate in loose family groups of around 3 to 7 birds. Superb Fairy-wrens are co-operative breeders and offspring will assist the parents in raising their younger siblings. The male birds transform their plumage to rich blues and blacks when breeding, hence their colloquial name 'Blue Wrens'.

This report considers the status of Superb Fairy-wrens in Glebe in spring 2007, and the actions for conservation of this species. It discusses: the current distribution of Superb Fairy-wrens; their habitat needs; recommendations for habitat conservation and enhancement, including suitable plant species for revegetation approaches; all with the aim of conserving this very delightful and beautiful bird species in Glebe and Forest Lodge.

² Birds in Backyards 2007. Guidelines for bird habitat. URL: <http://www.birdsinbackyards.net/spaces/> Accessed 16/11/07,

2.0 Assessment of the current status of the Superb Fairy-wren population in Glebe and Forest Lodge

Anecdotal evidence, and data from the Australian Museum's *Birds in Backyards* surveys, indicate that there are some Superb Fairy-wrens present in Glebe, but the picture is currently incomplete, and also dynamic. Family groups may breed, and birds disperse and die, presenting a changing picture from season to season and year to year. The three surveys undertaken as part of this project in spring 2007 can be considered as baseline data to compare data from future surveys to, and determine trends in Superb Fairy-wren population and distribution in Glebe and Forest Lodge.

2.1 Survey methodology summary

To determine the current status of the Superb Fairy-wren population in Glebe and Forest Lodge, three surveys were designed at the commencement of the project, in consultation with the Glebe Society Superb Fairy-wren sub-committee. Two of these surveys were designed to raise community awareness of the presence and needs of these birds in Glebe, as well as to involve the community in a meaningful way in the collection of the data. Two surveys were devised to find out the distribution of Superb Fairy-wrens in Glebe and Forest Lodge, and the third survey aimed to find out the numbers of Superb Fairy-wrens in Glebe and Forest Lodge. The methodology and format of the 3 surveys were as follows:

Survey 1

A public information campaign that included letterboxing, posting flyers in local shop windows, and other community outlets. The flyers (Appendix B) included photos of Superb Fairy-wrens, and asked residents who observed Superb Fairy-wrens in Glebe and Forest Lodge during August and September 2007 to report sightings to an email address. This survey was designed to help to determine the distribution of the Superb Fairy-wren in Glebe.

Survey 2

Existing corridors and other likely Superb Fairy-wren habitats, in particular those areas not covered by the letterboxing, were surveyed by the consultant during early September 2007. This survey was also designed to determine the distribution of the Superb Fairy-wren in Glebe and Forest Lodge.

Survey 3

Participants for this survey were recruited from The Glebe Society and from respondents to survey 1. This survey was designed to help to determine the population of Superb Fairy-wrens in Glebe. Community volunteers were recruited

for a 'snapshot' survey day held on Sunday 23rd September 2007. This survey covered all areas of Glebe at the same time, and was designed to help determine the numbers of Superb Fairy-wrens in Glebe as it was probable that responses to Survey 1 counted the same birds more than once.

The 'snapshot' survey day included a one-hour workshop where participants were briefed on the habits and habitats of Superb Fairy-wrens and how to make gardens more friendly for Superb Fairy-wrens. Following the workshop, participants were allocated an area of Glebe or Forest Lodge and give one hour to survey the area on foot for Superb Fairy-wrens. Participants were also given instructions on the use of visual and aural cues to assist them detect these small birds.

The aim of surveys 1 and 3 was to be fun, engaging and to raise awareness among the community of Superb Fairy-wrens and their habitats and threats, as well as to find out where they are. Survey results and discussion are discussed in summary below. Further details of survey methodology, results and discussion are included in Appendix A.

2.2 Survey results summary

Survey 1

Approximately 48 people responded to Survey 1, with an average of 3 to 4 birds reported per survey. This data is somewhat incomplete as some respondents did not or were unable to count the number of birds and did not report numbers, while others simply reported 'many' birds were seen.

Clusters of sightings reported by Survey 1 occurred around Toxteth and Boyce Lanes and Jarocin Avenue. Isolated sightings occurred in a few other places, including Campbell Lane, Ferry Road and Lombard Street, Figure 1.

Several respondents (approximately 10%) noted that they had seen Fairy-wrens in their gardens in the past, but had not seen them for 2, 5 or 20 years.

Survey 2

No Superb Fairy-wrens were recorded in Glebe in Survey 2, but a group of birds was seen in a weedy area along the Light Rail corridor on the boundary of Annandale and Leichhardt.

Survey 3

Three to five birds were recorded in Survey 3 (one or two birds may have been counted twice). These birds were seen at the western end of Boyce Street, near the intersection with Bell Street, and in Jarocin Avenue.



Figure 1. Locations of Superb Fairy-wren sightings reported in response to Survey 1. Male birds indicated by blue dots and females and juveniles by brown dots. Base map sourced from Where Is: www.whereis.com.au

In addition to the three surveys outlined above, the Birds in Backyards database at the Australian Museum was also queried. Data collected by the Birds in Backyards program between 2005 to 2007 indicated Superb Fairy-wrens were seen in Lombard Close, near Palmerston Avenue, Lombard Close near Lombard St, Woolley Lane near St James Ave, and Glebe Point Road near Eglinton Rd. That only five reports of Superb Fairy-wrens were reported to the Birds in Backyards program over a period of 2 to 3 years indicates the success of Survey 1 in this current project.

2.3 Current status of Superb Fairy-wren population

Responses to the surveys indicated a good level of awareness of Superb Fairy-wrens amongst some Glebe residents, and the desirability of this species as a backyard bird. It is most encouraging that Superb Fairy-wrens are still present in Glebe and Forest Lodge: that they are still present in such an urbanised area after 200 years of non-Aboriginal settlement is indicative of their resilience. However, some family groups may be fairly isolated, and survey results and anecdotal evidence indicate that the numbers of birds, and numbers of family groups of birds, in Glebe and Forest Lodge are in decline. Further surveys over future years would be required to confirm this.

The results of the three surveys, particularly results from Survey 1, indicate that the main stronghold for Superb Fairy-wrens is around the western end of Boyce Street and Boyce lane, extending south as far as Jarocin Avenue, and that there are also (possibly smaller) groups of birds in several locations east of Glebe Point Road.

That survey 1 was the only one of the 3 surveys that included private property and its success in finding birds relative to the other two surveys conducted highlights two important points:

1. That community involvement in fauna surveys is highly valuable, and in cases such as these, essential; and
2. That any attempts to conserve Superb Fairy-wrens and their habitat in Glebe and Forest Lodge *must* include residents and private property and gardens.

It was encouraging to find that there appears to be several family groups of Superb Fairy-wrens living in Glebe, and that groups also exist in Sydney University. Groups of birds are also likely to be present in Leichhardt and Annandale, although further research is required to verify this. In such an urbanised area with very little suitable habitat available, and a number of predatory species also present in the area, it is remarkable that these populations still survive.

The Superb Fairy-wren population (or populations) in Glebe in 2007, based on the information currently available, are small and fragmented, and are probably in decline, and may continue to decline without enhancement and additions to habitat on both public and private land, including the creation of habitat corridors that provide safe passage for small birds, away from predators and larger, aggressive birds. To accurately determine population size and trends, further research over a number of years would be required.

Recommendation 1

That surveys of populations and the distribution of Superb Fairy-wrens in Glebe and Forest Lodge occur at regular intervals (at least annually) over the next five years, and preferably for 10 to 15 years. Surveys will need to include areas of public and private land as well as lands that are planted specifically for the purpose of Superb Fairy-wren habitat, to determine the success of these habitat enhancements.

Surveys need to include data collected by residents so as to include Superb Fairy-wrens present on private land.

3.0 Superb Fairy-wren habitat requirements

Superb Fairy-wrens are a sedentary species that maintain territories throughout the year. They live in small family groups, which guard small-scale empires that include a safe retreat of thick-growing shrubs. Open areas of lawn or mulch are a rich food bowl for these birds³. A family group of Superb Fairy-wrens birds can survive, if food, shelter and nesting sites are present, within a suburban landscape in a territory of less than 1.1 hectares (H Parsons, pers. comm.).

Essential to the persistence and survival of Superb Fairy-wrens in a territory in an urban environment is an awareness by humans of these birds' food, shelter and habitat need. As well as adequate food supplies, safety from predators is a major element of a good Superb Fairy-wren habitat.

3.1 Superb Fairy-wren foraging requirements

Superb Fairy-wrens' diets consist predominantly of insects and arthropods (e.g. spiders), but can be supplemented by seeds, flowers and fruit. Grasshoppers are a favourite food of Superb Fairy-wrens. An adult Superb Fairy-wren eats approximately 7.5 g of insects each day, and when breeding would need to find additional food to feed their young. A nestling eats approximately 4.5 g of insects per day.

Foraging takes place on the ground and on plants, and it follows that for a family group of Superb Fairy-wrens to survive, it is essential for them to have access to insect food: on the ground, in grass or in leaf litter, and/or on plants. Insect attracting plants are therefore an important element of a Superb Fairy-wren habitat.

Mulch, especially leaf litter, is also an excellent insect and arthropod habitat. Lawns can also be good insect habitat. Lawn for foraging with dense shrubs for safety nearby, especially shrubs with foliage that reaches all the way to ground, is ideal Superb Fairy-wren habitat, and this kind of habitat can easily be created in parks and domestic gardens.

It is also important to restrict the use of pesticides around Superb Fairy-wren habitats. Insecticides kill off insect food sources or if poisoned insects are eaten, these chemicals can accumulate in birds' bodies and cause health problems for birds.

³ NSW National Parks and Wildlife Service. *Backyard Buddies - How to make your Garden Superb Fairy-wren Friendly*.



Figure 2. Known Superb Fairy-wren habitat in Railway Parade Annandale.
Note the density of vegetation and variety of plant heights and growth forms.

3.2 Superb Fairy-wren roosting and nesting requirements

Superb Fairy-wrens need safe shelter for taking refuge from predators, roosting and nesting. Diurnal predators include cats and carnivorous birds such as Pied Currawongs. Nocturnal animals such as possums will also eat eggs and small birds. The absence of larger trees in a Superb Fairy-wren habitat can discourage the presence of these arboreal animals and can therefore make habitat safer for Superb Fairy-wrens.

Superb Fairy-wrens prefer dense shrubs that cannot be penetrated by larger, carnivorous birds or other predators such as cats. Shrubs need to be at least 1.5 m to 2 m tall, and reach all the way to the ground. A good rule of thumb as to whether a shrub is safe roosting habitat for Superb Fairy-wrens, is whether it is dense enough to block all light from the other side. Tangled and densely growing climbing plants and vines can also be good roosting habitat. It is important to acknowledge the importance of shrubs that reach right down to the ground - for easy and quick access to protective shelter and also so that predators cannot enter shrubs from below (cats and Pied Currawongs will do this!)

Dense shrubs and vines are also required for nesting. Superb Fairy-wrens build nests from grasses fine twigs and spiders' webs, and line these with wool, feathers or animal hair. Nests are built in shrubs, often only 1 m above ground, and are dome-shaped with a side entrance (rather than the more common bowl-

shaped birds' nest with an open top). Nests are usually well-concealed in dense shrubs, and are only noticeable when family members are visiting.

3.3 Superb Fairy-wren dispersal requirements

Superb Fairy-wrens are a sedentary species, maintaining a small territory throughout the year. While a family group of Superb Fairy-wrens can survive in a fairly small area, if habitat requirements are met, connectivity among territories is essential for dispersal and breeding in the medium to long term. Once fledged, the male birds stay with the family group to help raise the next clutch of young, but female birds are expelled from the family group to find new territory. Research conducted in Canberra has indicated that around 75% of Superb Fairy-wren chicks are not fathered by a member of the family group. This means that it is essential for females to move safely to new territories. Superb Fairy-wrens are well-known to be weak flyers, and need continuous corridors, or closely-spaced 'stepping stones' of vegetation to disperse to new territories. In urban areas, structures such as fences, clotheslines and roofs can be used to break up flying distances.

It is therefore essential for the persistence of Superb Fairy-wren populations that territories are connected to each other, and that these connections allow birds to travel among territories safely. Without this opportunity to disperse and colonise new territories, populations may decline, eventually to extinction.

3.4 Plants for Superb Fairy-wren habitat

Superb Fairy-wrens prefer dense shrubs, reeds and tall grasses, thorny climbers, and insect-attracting plants. Taller trees are not usually used by Superb Fairy-wrens, and these trees often attract predators of small birds. Plants suitable for Superb Fairy-wren habitat are discussed further in section 4.1, and recommended local native plants are listed in Appendix E.

3.5 Interactions among Superb Fairy-wrens and other bird species

Noisy Miners and other honeyeaters

The presence of aggressive, territorial birds will also determine whether a habitat is suitable for Superb Fairy-wrens. Honeyeaters display highly territorial behaviour. The most fiercely territorial honeyeater present in Sydney is the Noisy Miner, although other honeyeaters such as wattlebirds also exhibit this behaviour. Noisy Miners form strong social groups, and will chase any other birds from their territory, if it can be defended. Like most honeyeaters, Noisy Miners are attracted to showy, nectar-producing flowers, such as flowering eucalypts and grevilleas with large showy flowers (especially red and orange coloured flowers) on the outside of the plant, and exotic species such as coral trees *Erythrina* sp. (locally

indigenous grevilleas have small flowers on the inside of the plant, that are too small to fit the beaks of larger honeyeaters and are therefore recommended).

Noisy Miners will only inhabit and defend territories that have cleared understoreys, or the open edges of denser vegetation. The landscapes of most Australian suburban parks, with a few shade trees (often eucalypts), little or no understorey, and mown grass, are therefore ideal Noisy Miner habitat. Landscaping practices of canopy lifting and undergrowth clearing make landscapes very suitable for Noisy Miners and unsuitable for Superb Fairy-wrens. These landscapes, while most suitable for humans, will not enhance urban bird diversity, and this is another reason why retention and creation of Superb Fairy-wren habitat needs to also occur on private property as well as on public land.

Other honeyeater species are less aggressive than the Noisy Miner, but are still territorial and eager to defend food resources, and will chase away small birds, including Superb Fairy-wrens. Other honeyeater species present in Glebe include Wattlebirds and Rainbow Lorikeets. These birds are attracted by nectar-producing flowers and food handouts from humans.

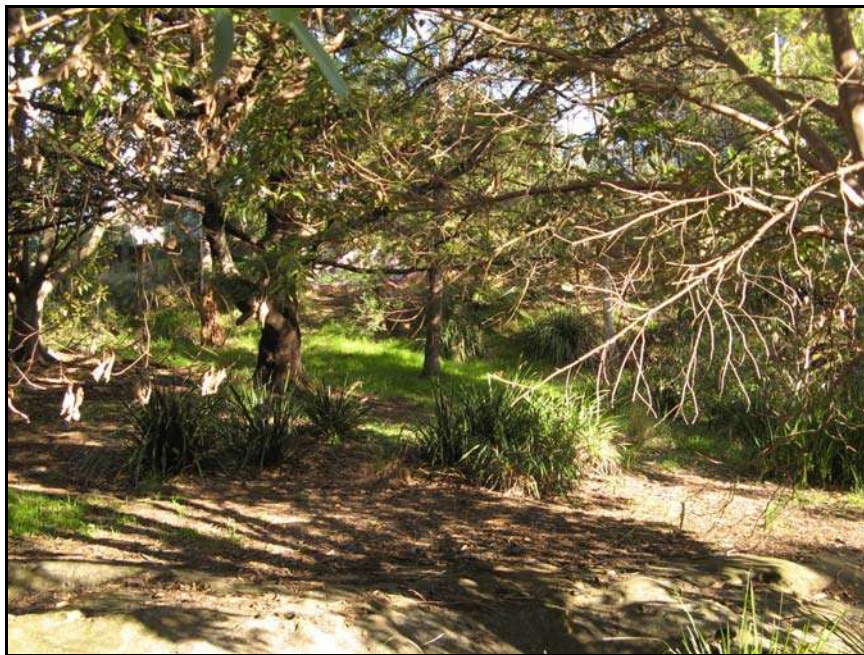


Figure 3. The vegetation at this site has canopy and some ground cover, but minimal shrub layer, and the area is dominated by Noisy Miners. Rozelle Bay Light Rail stop.

Pied Currawongs

Pied Currawongs are a major predator of Superb Fairy-wren birds and eggs, and their presence has been correlated with the decline of native bush (small) bird populations⁴. Pied Currawongs are carnivorous and frugivorous birds that are

⁴ Bayly K.L. & Blumstein D.T.2001. *Pied Currawongs and the decline of native birds*. *Emu* **101**,199-204.

attracted to trees and shrubs with soft, fleshy berries, such as Chinese Hackberry *Celtis sinensis*, Camphor Laurel *Cinnamomum camphorum*, *Pittosporum undulatum*, lilli pillies and fig trees. One respondent to Survey 1 even suggested culling currawongs. Their email read:

“

There were a family of Superb Fairy Wrens living below my unit balcony from 1997 to 2005. They disappeared a couple of years ago and though they are no longer there some value may come from my observations. I lived near the park between Ferry Rd and Palmerston Ave walkway down to the Glebe light rail stop.

The Wrens lived in a dense bottle brush shrub about 2 metres high that had a lot of tall (600mm) tufted and quite dry grass near it. *With the change over to Sydney City Council and their improved gardening practices the grasses have gone perhaps causing loss of habitat.* (italics added).

I however put their demise down to the rapid rise of the Currawong population in the area over the last few years. I counted 16 in the small park at once recently.

The Currawongs exhibit a very aggressive and predatory behaviour toward other birds, some people have suggested they eat the young of other species? Over the same period they have almost chased away the Bulbuls that were abundant in this area. They nest in our unit's garden and are even aggressive toward people. I think for the sake of diversity a cull of Currawongs should be considered..

”

email response to Survey 1

While anecdotal in nature, this scenario is typical of what is happening to Superb Fairy-wren habitat in urban environments. I do not advocate the culling of any bird species, and the culling of any native bird species is undesirable, and, in the case of native birds, illegal. It is often an ineffective method of population control, as, if habitat conditions remain unchanged, more birds will simply move in to fill the vacuum created by culling. Also, culling of birds does not always limit deaths to the target species, and can also maim and harm birds, if not carried out correctly. Habitat modification is a far more effective and sustainable method of managing populations of undesirable bird species.

Pied Currawongs are also known to be attracted food handouts from humans, and to pet food left outside, and often householders are unaware that they are supplementing these birds' diets.

Recommendation 2

That residents be discouraged from feeding any wild birds, whether intentionally or unintentionally.

Recommendation 3

That areas of both private and public land, especially those that are intended for Superb Fairy-wren habitat, be modified to make them less attractive to Pied Currawongs. This includes ceasing of planting (and in some cases removing, especially where plants are listed as noxious or environmental weeds) trees and shrubs that produce soft, fleshy fruits, in particular *Celitis sinensis*, and with the notable exception of Lantana *Lantana camara*.

3.6 Interactions among Superb Fairy-wrens and other animal species

Superb Fairy-wrens and their eggs can be attacked and eaten by both native and domestic animals. Brush-tail possums will eat both eggs and young birds, and cats will kill birds, even when they are not hungry. Cats that merely 'catch' a bird and then release it will cause the bird to die, by infecting them with bacteria present in the cat's saliva, if the bird's skin is at all punctured. Residents need to be encouraged to keep their cats inside at all times, or provide their animals with a caged 'cat run'. The most critical times are around dawn and dusk, but cats will attack birds at any time of the day or night.

3.7 Summary of Superb Fairy-wren habitat requirements

Like most species, Superb Fairy-wrens require a safe home, food to eat, and a place to raise a family. Superb Fairy-wrens need:

- ✦ Dense shrubs, at least 1 to 1.5 m high, and so dense that daylight cannot be seen through them;
- ✦ Shrubs that reach to the ground;
- ✦ Shrubs that adjoin lawn or leaf litter for safe foraging;
- ✦ Protection from domestic pets, especially cats; and
- ✦ Protection from aggressive and predatory native animals, including carnivorous birds, aggressive honeyeaters and possums.

Recommendation 4

That staff of authorities that manage public land in Glebe and Forest Lodge, including schools, as well as local residents of Glebe and Forest Lodge, be made aware, through an information and education campaign, of the habitat requirements of, and threats to, the Superb Fairy-wren.

4.0 **Plantings, locations and landscaping techniques for Superb Fairy-wren habitat**

To conserve the Superb Fairy-wren in Glebe and Forest Lodge, the following approach is recommended:

- ✦ To conserve and enhance existing Superb Fairy-wren habitat;
- ✦ To create additional Superb Fairy-wren habitat, especially in identified 'corridor' areas;
- ✦ To develop and implement plans to mitigate threats to Superb Fairy-wrens; and
- ✦ To educate residents and landscaping and parks and gardens staff of public land managers as to the needs and likely locations of Superb Fairy-wrens.

This section details recommended plant species, locations and landscape practices to conserve, enhance and create Superb Fairy-wren habitat. Its contents need to be considered keeping in mind that adaptive management is also an essential part of any conservation program, and feedback from regular surveys of birds will indicate which approaches and locations are working best and which need to be reviewed.

4.1 **Planting recommendations**

As described in section 3, Superb Fairy-wrens habitat requirements include plants to attract insect food and plants for nesting and roosting, and shelter from predators. Dense, thorny and tangled shrubs, tall reeds and grasses, vines and climbers, and an absence of trees and shrubs that attract aggressive and predatory bird species, are necessary for safe Superb Fairy-wren habitat. Shrubs planted beside safe lawn areas for foraging can enhance insect food supplies. Suitable plant species may be native or exotic - it is the structure of the vegetation that is most important.

Plants for food - insect attracting plants

Native plants with small, white, cream or yellow flowers, often heavily scented flowers, are especially attractive to insects. Exotic plant species such as roses and lemon trees also attract insects, and in domestic gardens, insects are also attracted by compost heaps. To ensure a year-round food supply (as Superb Fairy-wrens are a sedentary species), a range of plants that flower at different times of the year is helpful.

Plants for shelter

Dense shrubs, vines, and climbers that are spaced close together, and tangled and thorny plants make the best for shelter for Superb Fairy-wrens. A good

indication that shrubs are dense enough for Superb Fairy-wren habitat is that daylight cannot be seen through them. Tall grasses, herbs and reeds, such as Fennel *Foeniculum vulgare*, Common Reed *Phragmites australis*, and Bulrush *Typha orientalis* are also good shelter for Superb Fairy-wrens.

4.1.1 Locally indigenous species

Planting local indigenous plant species is wise for several reasons. Locally indigenous native plants are evolutionarily adapted to local soils and climates, and they have also evolved together with local fauna, thus making them ideal choices for habitat plants. Contrary to common beliefs espoused during a trend for native plant popularity that occurred 20 to 30 years ago, native plants are not maintenance free. While many native plants are more suitable for dry climates and nutritionally depauperate soils than many exotic plant species, making them less demanding in terms of care, they do require some maintenance, including watering during an establishment period after planting. Pruning is also strongly recommended to keep most native shrubs plants in a dense and compact habit (see 'landscaping techniques' below).

Plant list

Thanks to some dedicated research from some of Sydney's botanists and bush regenerators, there is now a fairly comprehensive guide to the native plants that grew in Sydney's inner west prior to non-Aboriginal settlement.

A list of suggested indigenous native plant species for Superb Fairy-wren habitat is included in Appendix E. Native plants recommended include paperbarks, honeymyrtles, teatrees, wattles, pea plants, daisy bushes, hakeas, heath plants, Port Jackson Pine, Australian Blackthorn, some (small-flowered) grevilleas, climbers and tall reeds and grasses. Native plants not recommended include nectar-producing species such as eucalypts, 'showy' grevilleas and bottle brushes.

Where possible, locally indigenous species should be chosen over other native and exotic plants for habitat plantings. The list in Appendix E focuses on locally indigenous species to enable plantings and revegetation projects, whether on public or private land, to also serve the purpose of conserving local plant biodiversity.

Locally indigenous plant species can be difficult to obtain, but many can be found in community nurseries, and with enough demand from councils, landscapers and the general public, nurseries could be encouraged to propagate or stock these species. This is also a good reason for the support of community nurseries, as they are the most likely nurseries to propagate or stock such plants.

Where local species are not available, a plants of similar habit and flower type from the same genus may be able to be substituted, for example, there would be several species of the genus *Melaleuca* that may be able to be substituted for the indigenous species listed, but care needs to be taken, especially when substituting from within genera that include plants with showy flowers, e.g. some *Grevilleas*.

It needs to be noted that care needs to be taken when selecting plants from sources such as retail nurseries and garden centres that simply call a plant 'bird attracting'. This term is quite generic in relation to birds, and is often used to refer to plants that have showy, nectar-producing flowers, in other words, they are 'honeyeater attracting plants', and planting them will not assist in the conservation of small birds such as Superb Fairy-wrens.

4.1.2 Exotic plant species

Many exotic plant species can also make good Superb Fairy-wren habitat. It is important to remember though, that many exotic species may also be environmental weeds (and that some plants considered environmental weeds make excellent Superb Fairy-wren habitat!)..

Exotic species that Superb Fairy-wrens have been seen in around Glebe (as reported in responses to Survey 1) are listed in Table 1. This list is included to demonstrate that many residents will already have valuable Superb Fairy-wren habitat plants in their gardens, even if they do not have any native plants there, and to emphasise the importance of retaining vegetation that is already valuable habitat. It is not always necessary to remove exotic plants and replace them with natives to create a habitat garden, although native plant species are recommended for supplementary plantings.

Exotic plant species	Possible habitat uses
Lemon and other citrus trees	food, e.g. scale and aphids
Roses - especially briar and climbing roses	food, e.g. aphids, and shelter
Bougainvillea	shelter, possibly food
Plumbago	shelter
Lantana	shelter and nesting sites
Camellia	food- insect attracting plant
Honeysuckle	shelter and nesting sites
Jasmine	shelter, possibly nesting sites
Ivy	shelter
Manchurian Pear tree	unknown
Curry tree	unknown
Fennel	shelter, possibly food

Table 1. Some exotic plant species that were reported being used as Superb Fairy-wren habitat in Glebe in Survey 1.

The prevalence of Superb Fairy-wrens in fruit trees, especially citrus trees, and roses indicates that this is a useful form of natural insect and pest control.

Some of the suitable Superb Fairy-wren habitat plant species may be considered environmental weeds in parts of Sydney that adjoin native bushland, but in an inner-city suburb such as Glebe, their benefit for small bird habitat is likely to far outweigh the risks of these plants escaping into bushland. Invasive plants that are spread by birds, such as trees and shrubs with small, fleshy fruits, are likely Pied Currawong habitat, and are not recommended.

Superb Fairy-wrens were also reported seen in Bottlebrushes *Callistemon* sp. - a native species, but these have not been recommended as these plants can attract aggressive honeyeaters such as Noisy Miners and Wattlebirds.

Recommendation 5

That residents and public land managers be encouraged to retain exotic plant species that are recognised as Superb Fairy-wren habitat on their properties, as well as to plant native shrubs, and that awareness be raised of the usefulness of Superb Fairy-wrens as a natural form of insect control.

4.1.3 Plant species to avoid

Just as important as planting or retaining habitat plants for the Superb Fairy-wren, is the avoidance and removal of some plant species. In particular, when conserving or creating Superb Fairy-wren habitat it is important to avoid the use of plants that will attract carnivorous birds and aggressive territorial birds. A very common carnivorous bird in Glebe is the Pied Currawong. Pied Currawongs also eat fruit, especially small, fleshy fruits. Pied Currawongs have increased their numbers in Sydney, mainly because they have been able to stay in the suburbs thanks to plantings of exotic plant species that produce small, fleshy berries, and may also produce fruit in seasons outside the fruiting period of native plants such as figs. Plant species that attract Pied Currawongs to their fruit include Camphor Laurel, *Pittosporum undulatum*, Cotoneaster, *Pyracantha* and Privets. Paradoxically, Lantana also fits into this category of exotic plants that produces small fleshy berries, although Pied Currawongs do not seem feed on Lantana fruits, perhaps because the dense and tangled nature of these plants does not allow larger birds such as Pied Currawongs access to the small fruits.

Exotic plants that are not recommended include Privets, Cotoneaster, Chinese Hackberry, and other trees and shrubs that produce small, fleshy fruits. A tree that is common in Glebe and also a Pied Currawong-attractor is the Chinese Hackberry *Celtis sinensis*. Pied Currawongs were sighted in these trees in several locations during Survey 2. These plants are a prolific environmental

weed in the inner suburbs of Sydney, and once established, can grow into very large trees and become difficult and expensive to remove.

Other plant species to avoid are those that attract Noisy Miners and other aggressive Honeyeaters. These include nectar-producing species, especially those with large, bright, red or orange-coloured flowers on the outside of the plant, and those with long flowering periods. Plants to avoid include both native and exotic species such as hybrid grevilleas including Grevillea 'Robyn Gordon' and Grevillea 'Superb', some eucalypts, callistemons, and coral trees *Erythrina x sykesii*.

Recommendation 6

That the planting of honeyeater-attracting plant species such as flowering eucalypts, bottlebrushes and hybrid Grevilleas, (e.g. Grevillea "Robyn Gordon, and Grevillea 'Superb'), and other plants with large, showy, nectar-producing flowers, (especially red and orange coloured flowers), be minimised wherever possible on both private and public lands, but particularly in identified Superb Fairy-wren habitat corridors.

Recommendation 7

That Chinese Hackberry *Celtis sinensis* trees and seedlings be removed wherever possible from both public and private land in Glebe and Forest Lodge.

4.2 Corridors

Superb Fairy-wrens are small birds that are fairly weak flyers. They need continuous vegetation, or at the very least 'stepping stones' or fairly closely-spaced patches of suitable vegetation cover, to be able to move through the landscape. While the Superb Fairy-wren is a sedentary species, once mature, females are ejected from the family group and forced to find new breeding territories. Connecting vegetation will assist females to disperse and therefore offer a chance for the population of birds in Glebe to increase. Habitat corridors are also useful for birds to travel within territories to find food and nesting sites.

4.2.1 Determining corridor routes

Determining the most suitable route for corridor creation and enhancement is challenging in an urban area. While satellite photos of the area can be of some assistance when planning such corridors, as they show where large buildings and roads are placed, and while these can be considered to be a 'bird's eye view' from the perspective of a high-flying bird such as an ibis or a pelican, these do not really illustrate the landscape from the perspective of a small bird that rarely flies higher than, say, 10 metres above the ground. Areas that can be identified as vegetated from a satellite photo may be totally unsuitable for small bird habitat. For example, taller trees show up well on satellite photos, but smaller bushes may not show up very well, if at all. Tall trees may be the habitat of birds, such as Pied Currawongs and Noisy Miners, that need to be actively discouraged from potential Superb Fairy-wren habitat.

In a highly urbanised area such as Glebe, with so many pressures on vegetation and a range of user needs for small pockets of open space, successful corridor routes may simply be where residents and public land managers are sympathetic to the needs of these birds and plan and maintain their gardens and lands with Superb Fairy-wren habitat needs in mind.

As a start to developing Superb Fairy-wren corridors in Glebe and Forest Lodge, a map (Figure 4) suggesting potential corridors, has been drafted, with places where vegetation can be conserved, enhanced or installed, in mind. Further bird surveys, and review of corridor areas, their vegetation, and their success in attracting Superb Fairy-wrens and the willingness of residents in corridor areas to participate in a conservation program, as part of an adaptive management process, are necessary to develop and sustain corridors. To further determine corridor routes, further ground truthing of corridor areas, and potential corridor areas, could be possible with further funding and residents' assistance and their permission to view private gardens situated along corridor routes.

Continuous corridors are not always necessary. But if 'stepping stones' are to be used instead of continuous corridors, it may be beneficial to have clear sightlines between one 'stepping stone' and the next, so that the Superb Fairy-wrens can see their next safe refuge before setting out to reach it. Keeping in mind that Superb Fairy-wrens are weak flyers, stepping stones need to be kept fairly close together (perhaps <50 m). Corridors do not always need to link habitat areas at both ends. They are necessary for females to disperse to new breeding territories, and this can sometimes be achieved with a 'dead end' corridor.

4.2.2 Suggested corridor

There are several options for corridors within Glebe, and their placement may depend on willingness of residents and public land managers to participate in the retention, enhancement and creation of Superb Fairy-wren habitat. Potential corridors are shown in Figure 4.

An initial approach could be to survey residents in streets where Superb Fairy-wrens have been sighted in 2007 to find out the level of interest and willingness of residents to plant Superb Fairy-wren habitat gardens in their properties, and otherwise take actions to make their gardens more Superb Fairy-wren friendly. Residential areas are also good for Superb Fairy-wren corridors as they often lack the eucalypts and fruiting trees (such as figs) that attract Pied Currawongs, and also offer structures, such as fences, for small birds to hop along to break up their flights.

Recommendation 8

That conservation efforts for Superb Fairy-wren habitat initially focus on the area bounded by Toxteth Road, Harold Park Paceway and Ross Street, Mansfield Street to the east and St Johns Road to the South, and that conservation efforts include both public and private land within this area.

Recommendation 9

That residents in streets where Superb Fairy-wrens were reported in Survey 1, and in suggested corridors, be encouraged to make Superb Fairy-wren friendly gardens. Information and free plants to be distributed to residents in these areas. Consider extending this program beyond corridors as funds allow.

Recommendation 10

That locations for plantings and habitat enhancement initially focus on areas where Superb Fairy-wrens have been sighted, and on areas that can connect these to other potential habitats.

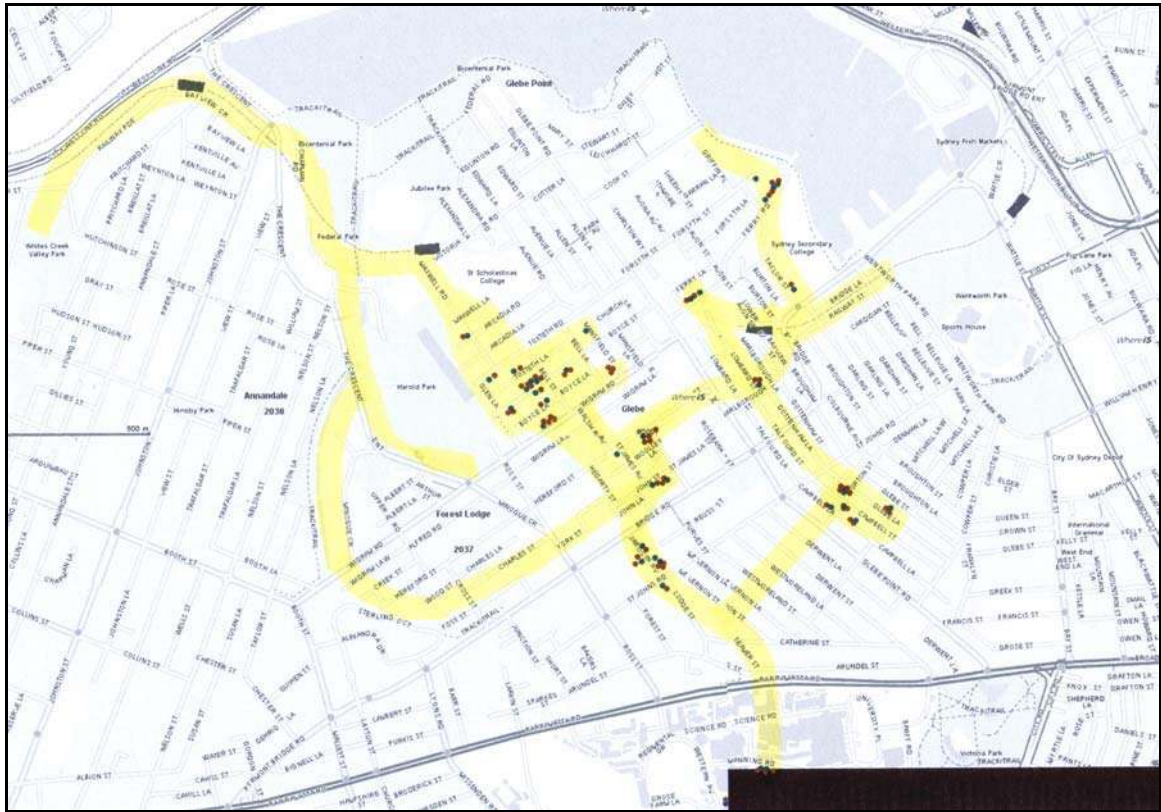


Figure 4. Map of potential Superb Fairy-wren corridors, indicated in orange.



Figure 5. An area suitable for revegetation (left pf photos) near Glebe Light Rail Stop, Palmerston Ave. When revegetating areas Superb Fairy-wrens are known to be using, it is essential to leave all existing shrubs *in situ* until supplementary plants have established to maturity. Weed trees, especially Chinese Hackberry, can be removed earlier.

Some parts of Glebe are also less likely to be good for corridors. There may be little evidence of Superb Fairy-wren habitation in these areas, and the present vegetation offers little or no habitat value, but potential remains in some areas. For example, areas east of Glebe Point Road (excluding the area around Sydney Secondary College), and around the foreshores of Blackwattle Bay, where there have been new housing developments constructed and parklands have generally been landscaped in an open and simplified style, there are generally less opportunities than in the 'leafier' north-west of Glebe and Forest Lodge.

Corridors mapped in Figure 4 include areas where Superb Fairy-wrens have been sighted and areas where they have not been sighted, but potential exists for them to disperse, given appropriate habitat. Priorities for revegetation and habitat enhancement would be best given to areas where birds have been recently sighted, and if funding allows, then be extended to the other corridor areas marked on the map. Outside of Glebe, corridors will hopefully connect with populations in Sydney University, Annandale and Lilyfield.

4.2.3 Metro Light Rail corridor

The Metro Light Rail corridor has the potential to be a most important habitat corridor. Data from Survey 2 indicates that revegetation along light rail corridor is currently not attracting many (or any) Superb Fairy-wrens, at least where this corridor traverses through Glebe. For example, the revegetation around Rozelle Bay station is inadequate for Superb Fairy-wren habitat in its current state. This vegetation consists of eucalypts (that attract Noisy Miners), no mown grass (nowhere for Superb Fairy-wren to forage), and little midstorey/shrub layer (easy territory for Noisy Miners to defend) (Figure 6).

The light rail corridor is one of the major opportunities for Superb Fairy-wrens to move through the area, given the appropriate vegetation. Superb Fairy-wrens have weak powers of flight and while they do not seem to need a continuous vegetation corridor, they do need at least 'stepping stones' of vegetation to move through the landscape. Dense plantings of shrubs wherever possible should be encouraged. Where the light rail travels underground, it is important to link the corridor above ground. Habitat plantings in the park above the eastern end of the Light Rail tunnel and at St. Scholastica's school may also be beneficial here.

A corridor also needs to be found for the wrens to cross Jubilee and Federal Parks, which are mostly very open and where the Light Rail corridor is above ground on a viaduct. Existing plantings along Chapman Road could be of benefit here. These could be connected across Jubilee and Federal Parks to habitat at the old tramsheds and Harold Park Paceway.

4.3 Locations for habitat plantings

Due to much of Glebe being a residential area, much of the Superb Fairy-wren habitat in the area will probably be on private land and on land managed by the City of Sydney and the Metro Light Rail company. However, Harold Park Paceway, the Department of Housing, St. Scholastica's School and public schools could also be involved and add to habitat opportunities, both existing and potential.

Many of Glebe's public parks would not make Superb Fairy-wren habitat even if canopy trees were underplanted, as canopy trees would still attract aggressive and predatory bird species. Plantings of shrubs in some parks might also ignite fears of these areas being suitable for some humans to use them for antisocial or criminal behaviour, however in these cases, the use of prickly and thorny plants in plantings would deter people from entering vegetated areas.

While the creation and retention of habitat on private land is essential to the persistence of Superb Fairy-wrens in Glebe, it is also important for the City of Sydney to set an example as well, so as to encourage residents and other authorities to do this. Past experience indicates that the community will be more likely to actively participate if Council can be seen to be supportive and setting an example by taking positive actions itself.

The following list of locations are suggested for the initial focus for retention, enhancement, and creation of Superb Fairy-wren habitat, as these are within the areas when most birds have been seen. This area includes the eastern side of Harold Park Paceway and adjoining streets, and the area south through to Jarocin Avenue. Public parks in this area include St James Park and Paddy Grey Park. If actions are successful in these areas, then extending the areas further along corridors can then be explored.

4.3.1 Public parks

Public parks are perhaps not always as suitable for Superb Fairy-wren habitat as some other lands, due to the many uses of these parks by people, possible public perception about the safety of dense shrubbery, use of parks for off-leash (and even on-leash) dog exercise, and the presence of aggressive, territorial and predatory bird species and predatory animals, but plantings in corners of Council-managed parks can still be an important link in identified corridors and are a good way to create awareness of Superb Fairy-wren habitat needs, especially if plantings are accompanied by interpretative signage.

Smaller parks will generally be more suitable than larger parks. Superb Fairy-wren habitat could be planted along park boundaries, especially fenced boundaries, and also boundaries of residential properties, where no sightlines exist, and do not need to be maintained.

In wetland areas, such as in Federal Park, Bicentennial Park and along Johnson's Creek, reeds such as Common Reed and Bulrush can be retained or planted for good safe shelter for Superb Fairy-wrens.



Figure 6. Parkland landscape - not good habitat for Superb Fairy Wrens. This open grassy area with well spaced trees is ideal habitat for Noisy Miners to easily defend. Federal Park near Light Rail corridor



Figure 7. Habitat planting on public land in Rosedale Reserve, Croydon Park. Note the absence of tall trees, the diversity of shrubs, shrubs planted close together and that reach to the ground, the inclusion of vines and climbing plants, and adjacent lawn area for foraging.

4.3.2 Other publicly managed land

Metro Light Rail Corridor

The Metro Light Rail corridor has great potential as a bird corridor, and is an ideal area to enhance for Superb Fairy-wren habitat. There are many opportunities along the rail line route to enhance and create Superb Fairy-wren habitat, including between Wentworth Park Road and the eastern end of the tunnel, and along the Crescent and beyond. Finding suitable habitat areas across the Jubilee/Bicentennial Park area may be more difficult, but installing patches of suitable vegetation as 'stepping stones' could be considered here, to link to the Annandale side, commencing with the land near the Old Tram Sheds.

Some recently revegetated areas along this corridor are not suitable for Superb Fairy-wrens (e.g. Figure 10), but could be enhanced with further plantings. Increased shrub density could create a noise buffer for the light rail and as it is not open to the public, should not raise any public safety concerns. These areas are also difficult for dogs to access. Some parts of the light rail corridor are bounded by mesh 'cyclone' fences, ideal for supporting vines and climbing plants (Figure 9(b)).



Figure 8. Superb Fairy-wrens used to use this area as habitat, but shelter plants have been removed - the Fennel and other plants have been slashed, with no replacement Superb Fairy-wren habitat created. Metro Light Rail corridor, The Crescent.



(a)



(b)

Figures 9(a) & (b). Areas on light rail corridor suitable for enhancement of vegetation for Superb Fairy-wren habitat.

(a) Corridor seen here from Bridge Lane, It would be important to keep some understorey plants here until new plantings had matured, and also to remove Chinese Hackberry trees.

(b) Seen here from Railway St, if this area were planted with midstorey shrubs, and vines were grown over fences, this could become good Superb Fairy-wren habitat.



Figure 10. A recent revegetation project that has no habitat value for Superb Fairy-wrens. Light Rail Corridor between Bellevue Street and Wentworth Park Road. The Chinese Hackberry s trees have been left in situ and the slope otherwise cleared and replanted with Lomandras and Dianellas. This is currently probably good Currawong habitat. Enhancement plantings of dense shrubs and removal of Chinese Hackberry trees may be able to convert it to good Superb Fairy-wren habitat.

Sydney Secondary College

Results from Survey 1 indicated that there might be a group of Superb Fairy-wrens living in and around Sydney Secondary College, and conservation of the group of birds residing there may be assisted by some plantings of suitable species and structure within the school Grounds.

St. Scholastica's College

This school is at the western end of the light rail corridor, and at the north-eastern corner of the Harold Park Paceway land, as well as close to the major existing Superb Fairy-wren area of Glebe. Habitat plantings within the school would be most beneficial, and students could be encouraged to become involved with planting and monitoring of bird populations within the school.

Forest Lodge Public School

Forest Lodge public school is also in the vicinity of areas where Superb Fairy-wrens have been sighted. Students here could also be encouraged to become involved with planting and monitoring of bird populations within the school.

Old Tram Sheds

Removal of Chinese Hackberry *Celtis sinensis* trees in the area between Jubilee

Park tram stop and Johnson's Creek, and replacement with plant species suitable for Superb Fairy-wren habitat could help reduce numbers of Pied Currawongs in this area, and give Superb Fairy-wrens a greater chance of survival.

Harold Park Paceway

Several opportunities for Superb Fairy-wren habitat creation exist within the grounds of the Harold Park Paceway, particularly along the eastern boundary along Glen Lane and up to the Old Tram Sheds, and also along the western boundary alongside Minogue Crescent and The Crescent. Removal of Chinese Hackberry trees along the eastern boundary of this land and replacement with plant species suitable for Superb Fairy-wren habitat could also help reduce numbers of Pied Currawongs in this area.

Opportunities for Superb Fairy-wren habitat creation could be investigated further once the future of this site is more certain. Any future development of this site could be encouraged to include an area for Superb Fairy-wren habitat.



Figure 11. Harold Park Paceway cnr. Minogue Crescent & Wigram Road.

Suggested locations for 'first wave' of Superb Fairy-wren habitat creation
☛ St James Park
☛ Paddy Grey Park
☛ Jubilee and Federal Parks (southern end)
☛ Metro Light Rail Corridor (all above ground areas)
☛ St. Scholastica's College
☛ Sydney Secondary College
☛ Forest Lodge Primary School
☛ Harold Park Paceway (especially eastern side)
☛ Land beside Old Tram Sheds
☛ Residential gardens, especially along identified corridor areas

Table 2. Suggested locations for first wave of Superb Fairy-wren habitat creation.

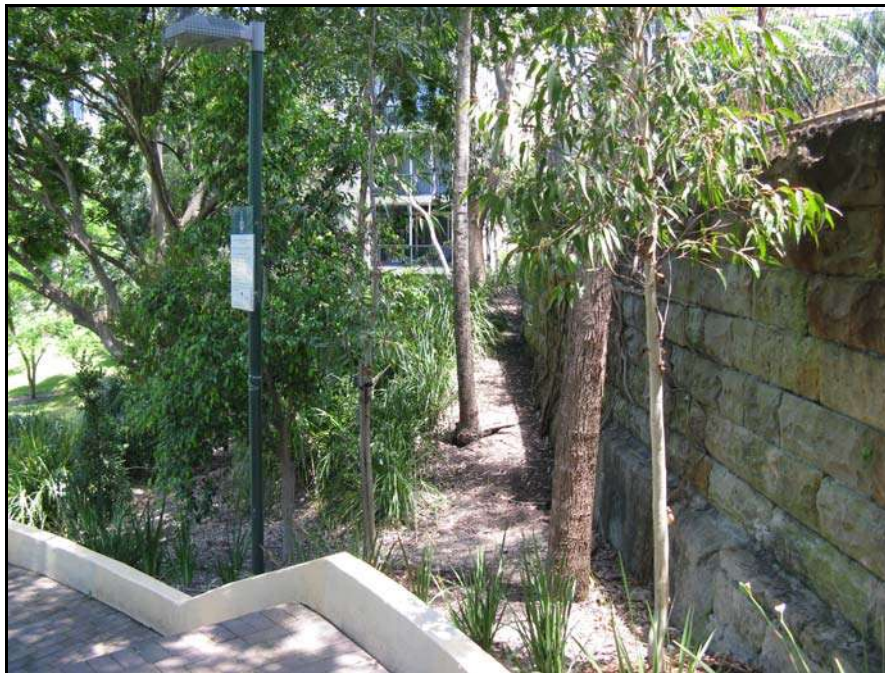


Figure 12. An area beside a wall in park, corner of Ferry Road and Avon St. This garden could easily be made more Superb Fairy-wren friendly by enhancing existing plantings.

4.3.3 Residential gardens

No Superb Fairy-wrens were observed in any surveys in this project in public parks that consisted only of canopy and mown grass. These habitats suit a number of larger and more aggressive species, particularly the Pied Currawong, Magpie, Noisy Miner and Rainbow Lorikeet, making them these unsafe and unusable for Superb Fairy-wrens in their present state.

Gardens of both private and public housing, but particularly private gardens, are most suitable for the retention and creation of Superb Fairy-wren habitat. Backyards, and in some cases, front gardens, can be ideal Superb Fairy-wren habitat. These birds enjoy foraging on lawns and plants for insects, and if the garden is free of predators such as cats, aggressive and predatory birds such as Noisy Miners and Pied Currawongs are absent, and if there is a refuge of shrubs nearby, Superb Fairy-wrens can happily live and breed in an area covering just a few backyards. Added advantages of backyards are that they often lack large trees that attract larger and carnivorous birds, and there are often structures present, such as fences and clotheslines, that birds can stop on during flight and help them to travel through the landscape.

It is essential to encourage residents, especially those with properties on designated corridor routes, to retain and create Superb Fairy-wren friendly gardens. Without residents' actions to provide habitat for these little birds, the results of some current landscaping practices, including the 'tidying' of public lands will eventually result in a local extinction of this species.



Figure 13. Great backyard habitat for Superb Fairy-wrens - a variety of insect-attracting shrubs, some lawn, and a safe bird bath. Photo: Debra Little

Recommendation 11

That residents, especially those located along corridor routes, be strongly encouraged to conserve or create Superb Fairy-wren habitat in private gardens, with education and incentives such as information campaigns and plant give-aways.

Recommendation 12

That a Superb Fairy-wren habitat demonstration garden be created on public land in accordance with the recommendations in this report. Garden to include interpretative signage with information about Superb Fairy-wrens and their habitat requirements. Possible sites include St James Park or land beside tram sheds beside Jubilee Park.

4.4 Landscaping techniques

Much could be done to enhance existing plantings on private land, and especially on appropriate sites on public land, to make these more friendly for Superb Fairy-wrens. A wider variety of plant species and habits could be used, including reeds, climbers and suitable shrubs. Many recently planted areas have quite poor species diversity, e.g. around Blackwattle Bay and Light Rail corridor, and plants are also spaced too far apart to be useful habitat for Superb Fairy-wrens. Interplanting some of these recent landscape works, as well as more established areas, with some species recommended in this report, to enhance structure and density to vegetation, could greatly increase the biodiversity and habitat value of some areas.

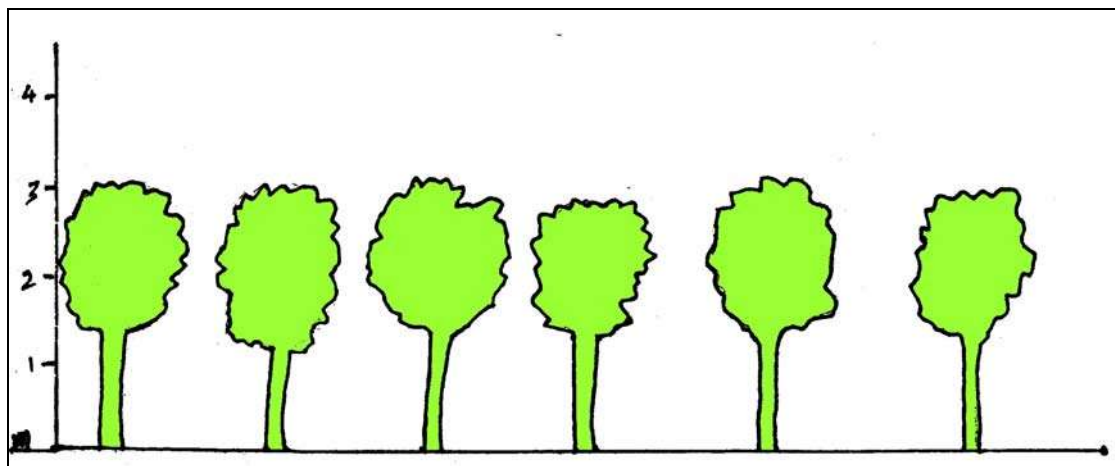
Landscaping techniques that can help enhance Superb Fairy-wren habitat include dense planting of shelter and insect-attracting plants, with a variety of plant habits (with the exception of large trees) for structural complexity, maintaining gardens for biodiversity by not being overly 'tidy' in maintenance practices, and removing woody weeds with soft fleshy berries that attract Pied Currawongs.

4.4.1 Density of plantings

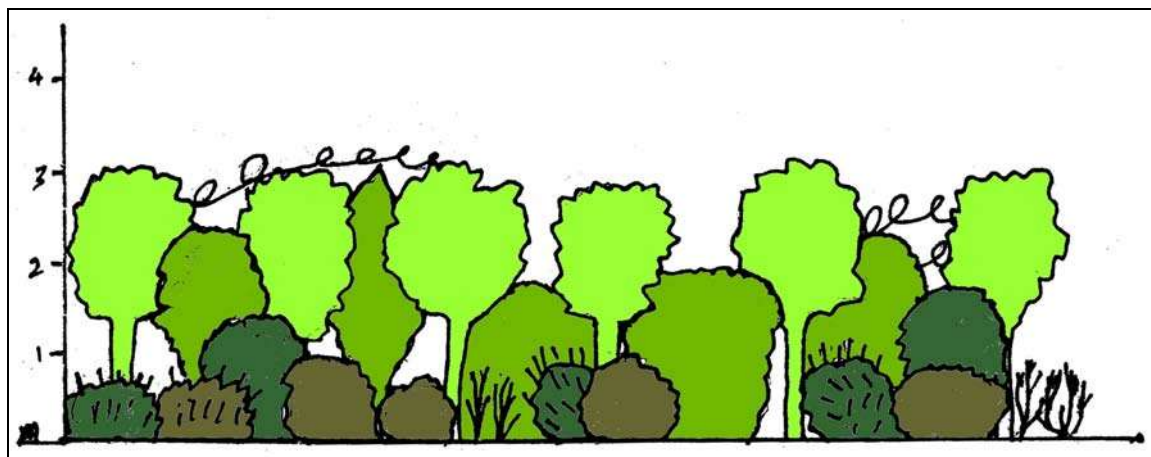
The importance of dense vegetation for Superb Fairy-wren habitat cannot be over-emphasised. Many existing planted areas in Glebe and Forest Lodge could be enhanced with supplementary plantings to increase density and structural complexity, making them more suitable for Superb Fairy-wren habitat.

Layers and diversity of plant habits and growth forms

It is important when planning and designing Superb Fairy-wren habitat to have a diversity of plant species, heights and include many 'layers' in the vegetation - i.e. groundcovers, tall grasses, small shrubs and large shrubs. Structure is vital, and more important than species choice - as long as dense, insect attracting shrubs, climbers and a range of shrub sizes and plants that reach continuously to the ground are planted. Exceptions in this instance are tall trees and trees and shrubs that have either large, brightly-coloured, nectar-producing flowers and those that produce small, fleshy berries.



(a)



(b)

Figures 14 (a) & (b). Side view of layered planting. Height in metres.

(a) Row of small trees with space easy for Noisy Miners to defend.

(b) Plants are close together and there is a variety of plant heights and growth forms.

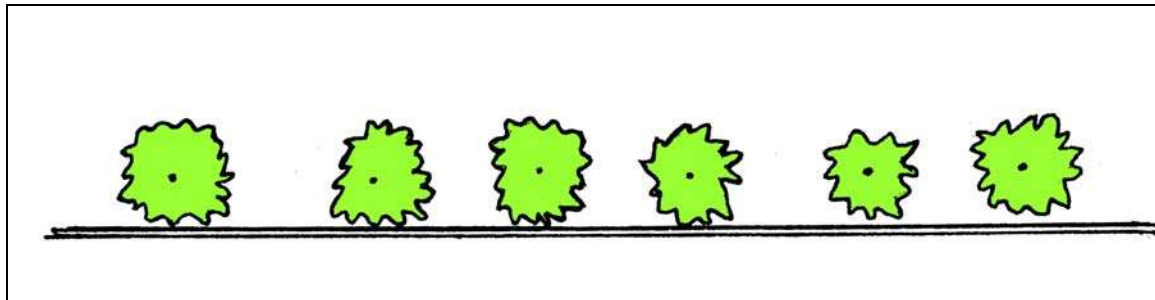
Edge effects

It has been well documented that aggressive bird species, the Noisy Miner in particular, frequent 'edges' of habitats, in particular the interface between open spaces and more densely forested woodland or forest, penetrating in from the edge distances that depend, at least partly, upon the density of the vegetation. This more open habitat is easier for groups of these aggressively territorial birds to control. To make existing, too open, areas of vegetation more suitable for smaller birds such as Superb Fairy-wrens, narrow strips of vegetation, need to be widened where possible, to decrease the edge-to-core ratio of vegetation patches. A single row of shrubs is often not sufficiently wide for Superb Fairy-wrens to seek refuge from predatory and territorial species.

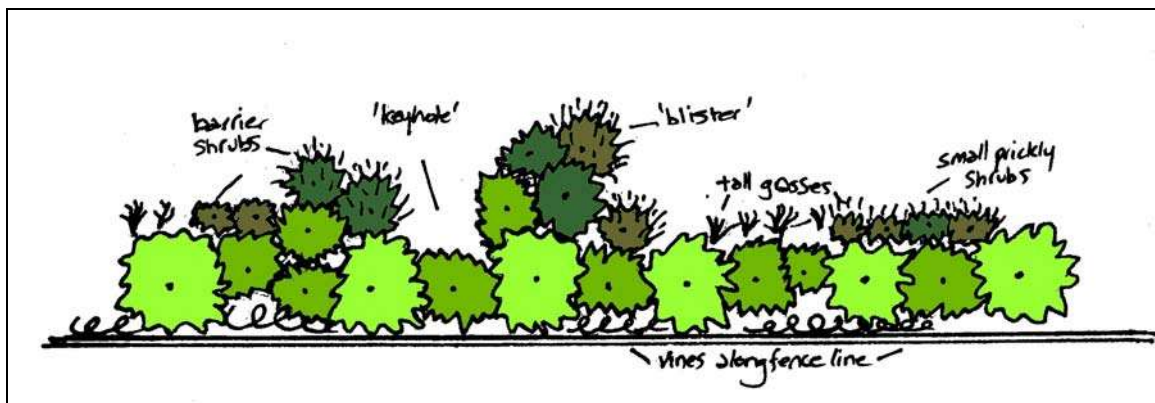
'Blisters' and 'keyholes'

In areas such as Glebe, where spaces are small, and wide tracts of dense vegetation may not be possible, many landscaped areas that are currently in

straight 'strips' or rows, especially along property boundaries, could be enhanced by extending these areas with 'blisters' and 'keyholes'. For example, along straight rows of shrubs, plant more shrubs out into lawn 2 or 3 shrubs deep in places, making a curvy, more aesthetically pleasing line and also potential Superb Fairy-wren habitat, if other factors necessary for good habitat are present (figures 15 (a) & (b)). These principles are also useful to bear in mind when planning new Superb Fairy-wren habitats.



(a)



(b)

Figures 15 (a) & (b). Illustration of blisters and keyholes (top view).

Original plants of typical row of well-spaced shrubs along a fence line in light green (a), enhancement plantings in dark green (b). Prickly border and infill plants and vines have also been added for density and structure (b).

Prickly and thorny 'buffer' plants

Prickly plants are commonly considered to be ideal habitat for small birds such as Superb Fairy-wrens. These plants may not be the ideal in comfort for birds (birds will perch between, but not on, spiky parts), but they can provide protection from predators. Prickly and thorny plants can make excellent barrier plants, providing protection for birds sheltering and roosting in less-prickly plants from larger species, both avian and mammalian. Thorny plants, such as (climbing) rose bushes, where prickles are further spaced, are probably some of the most useful Superb Fairy-wren habitat, as this gives these smaller birds comfortable perching space and protection.

Prickly and thorny plants can also be a natural and effective security measure around houses and in public areas. Public land managers are often pressured to remove dense shrubs or refrain from planting these on public land. It has been most disappointing to learn that Glebe Neighbourhood Watch Police are advising residents to remove shrubs from their gardens! These practices are not helpful to Superb Fairy-wrens, and the damage to Superb Fairy-wren habitats cannot be underestimated. 'Sight lines' are an important aspect of landscape design in some spaces, but when plants are beside a fence or wall, planting of shrubs 1 m to 2 m high is to be encouraged. The use of such vegetation around buildings can also offer insulation, making the home more sustainable by using less energy for heating and cooling.

4.4.2 Maintenance practices

Grass

Superb Fairy-wrens will forage for food on lawns where there is shelter and safety nearby. Small areas of grass or lawn are an important element of urban Superb Fairy-wren habitat, and small areas of grass close to shrubby shelter need to be included in landscaping designs. An effective way to do this is to develop a grass 'keyhole' shaped lawn within a planting of dense shrubs (see 'blisters' and 'keyholes' above). This shape offers shelter for Superb Fairy-wrens on more than one side of the grass area, increasing safety for the birds. Mowing can still easily be undertaken through the keyhole entrance.

'No mow' areas could also be established. These could be in no-traffic areas, e.g. corners of gardens. 'No mow' areas will allow grasses to flower, thus attracting insects, such as grasshoppers as food for insectivorous birds such as Superb Fairy-wrens and also production of grass seed for granivorous birds, such as finches.

Avoid 'canopy lifting'

The common landscaping practice of 'canopy lifting' - pruning lower branches of trees and shrubs back to the plant's trunk or core branches - is one that is detrimental to Superb Fairy-wren habitat and is to be avoided where possible.

Avoid removing 'undergrowth'

It is common for people involved in the care of parks and garden to remove any plants such as small to medium shrubs and medium to large grasses (sometimes categorised as 'undergrowth') in public planted areas, whether the plants there are weeds or not. Of course, there are some circumstances where open space under trees is desired (for shade, etc.) but in a garden bed situation this is not necessary. The practice of 'clearing undergrowth' needs to be discouraged, and instead the planting of small native shrubs and large grasses, as well as climbers and twiners, in these areas as part of a regular maintenance program needs to be promoted.

Pruning practices

Light and regular pruning of shrubs can encourage more vigorous growth and therefore greater plant density, and is to be encouraged. Formal hedges maintained this way can often be valuable Superb Fairy-wren habitat. Less regular and harder pruning can also be helpful, but it must only be undertaken outside of Superb Fairy-wren nesting season, which can occur between July and March, but mostly September to December. Pruning of small dead branches at the top shrubs is not recommended, as these can be useful lookout perches, with safety of shrubs below.

Avoid using pesticides

It is also important not to spray any Superb Fairy-wren habitat with pesticides (in particular insecticides), including on adjoining lawns, as use of these toxic poisons will either decimate the birds' food supply and/or, if poisoned insects are ingested by birds, poison can accumulate in birds' bodies, causing health problems. If colonies of insectivorous birds such as Superb Fairy-wrens are encouraged to gardens with suitable habitat, the birds should keep any insect populations in check, rendering pesticide use unnecessary. This practice is an integral part of any integrated pest management program.

Less 'tidying-up'

'Neat and tidy' has long been a paradigm of landscaping, gardening, and maintenance of public open space, but this paradigm is, generally, contrary to the principles of biodiversity, and really only benefits a few species, including humans.

One major contribution larger landholders can make to retention of existing Superb Fairy-wren habitat is to avoid some weed control and tidying of lands. Encouraging an urban landscape that is a little more organic, wild and unruly, may take some time, but a start needs to be made before species are lost.

4.4.3 Weed control and revegetation practices

It is not necessary to pursue weed control in areas of Superb Fairy-wren habitat. Weedy areas are often the last refuge for Superb Fairy-wrens in urban and woodland areas. Weeds Superb Fairy-wrens have been sighted in inner-western Sydney include Lantana, Fennel, Golden Wreath Wattle *Acacia saligna* (a WA species) and weedy vines.

Weed control should of course be maintained when the plants are known hazards to human health, e.g. Asthma Weed. However, many plants listed as noxious have been listed as they are an economic hazard, but in highly urbanised areas their value as habitat may outweigh their risks to agriculture (although this does not apply to weeds that are easily spread, e.g. aquatic weeds and weeds that are dispersed by birds).

Weed control priorities

When developing weed control priorities, the removal of woody weeds that produce small fleshy fruits, such as Large-leafed privet *Ligustrum lucidum*, need to be given priority, but Lantana should not be removed if it is being used by Superb Fairy-wrens for shelter, roosting or nesting. Plants of wastelands and wetlands, sometimes considered weeds, such as Fennel, Common Reed and Bulrush are also good shelter for Superb Fairy-wrens, and need to be retained where possible.

Chinese Hackberry *Celtis sinensis*

The removal of Chinese Hackberry *Celtis sinensis* on public land needs to be given a high priority. A staged removal, replacing removed trees with more suitable dense shrubs, can be undertaken over a number of years. Residents also need to be encouraged to help to reduce the numbers of these invasive and Pied Currawong-attracting trees on private property, possibly under a public campaign with an incentive of free Superb Fairy-wren-friendly dense shrubs to residents who remove the Chinese Hackberry plants from their property.



Figure 16. Removal of Chinese Hackberry trees has already commenced at this site near the Old Tram Sheds. Further removal of these trees and replacement with shrubs suitable for Superb Fairy-wren habitat could make this an important stepping stone in the Light Rail corridor.

Retain Lantana!

Weed control is recommended for woody weeds that produce small fleshy berries - except Lantana! While Lantana is a most serious weed elsewhere, such as in the bushland of the north coast of NSW, its benefit as a habitat plant far

outweighs its risk of spreading to bushland from Glebe! Any Lantana that is targeted for spraying or removal needs to be carefully monitored for the presence Superb Fairy-wrens over a period of several months, including during breeding season, and should only be removed if it is certain it is not being used by these birds. Any removal of Lantana needs to be staged in small sections over a period of many years - see revegetation practices below.



Figure 17. Lantana - good dense shrubby habitat.
Light Rail Corridor, The Crescent.

Revegetation practices

Retention of any suitable habitat is imperative to the persistence of Superb Fairy-wrens in a densely populated urban area such as Glebe. It is important when educating residents and landscapers about Superb Fairy-wren habitat to raise awareness that to create good habitat it is not necessary, and often detrimental, to clear weedy areas, and remove exotic shrub species from parks or gardens with the view to 'starting again' and re-planting with native plants. Residents, in particular, may already have plants in their garden that are suitable Superb Fairy-wren habitat, and to remove these could be fatal for these birds.

Where weed removal is necessary for other reasons, it must be staged slowly, treating small areas of weeds at a time and replanting these cleared areas as soon as possible. The next areas are not to be cleared until such time as newly planted revegetation area has established to maturity, (are flowering and fruiting - around 5 years for many species, with a shrub layer height of least 1.5 m), and surveys of these revegetation areas indicate that Superb Fairy-wrens are using these habitats. The new plants must also have been planted close enough together, and to have grown sufficiently to be touching each other, before the next stage of weed removal is undertaken.

It is especially important to retain plants with dense, tangled and thorny characteristics, e.g. Lantana, in place until new plantings have established to maturity. Otherwise, existing habitat is lost, and populations may die out. Weed trees, such as Chinese Hackberry, can be removed earlier.

Summary of recommended landscaping and planting practices

Recommended landscaping and planting practices
☛ Plant for density and complexity of structure
☛ Plant a variety of plant species and habits and plant forms
☛ Widen narrow plantings
☛ Plant prickly buffer plants
☛ Provide safe grassed areas for foraging
☛ Avoid clearing 'undergrowth' where possible
☛ Less 'tidying up'
☛ Avoid 'canopy lifting' of shrubs
☛ Prune shrubs lightly and regularly
☛ Avoid pruning in nesting season
☛ Avoid using pesticides
☛ Adopt weed control practices that do not cause further habitat loss
☛ Remove all Chinese Hackberry trees wherever possible
☛ Retain Lantana where possible
☛ Think before clearing any vegetation. Clear any unwanted vegetation very slowly and carefully, i.e. in stages.

Table 3. Recommended landscaping and planting practices.

Recommendation 13

That the landscaping practices discussed in section 4.4, summarised in Table 3, be adopted by public land managers with responsibility for public open space wherever Superb Fairy-wrens are known to be in identified corridor areas, and that residential gardeners also be encouraged to follow these principles when maintaining or creating Superb Fairy-wren friendly gardens.

Further scientifically-based information on the management of bird habitat in urban areas can be found on the Birds in Backyards website. URL:

<http://www.birdsinbackyards.net/spaces/guidelines.cfm>

5.0 Recommendations and Conservation Plan

5.1 Recommendations

To survive, Superb Fairy-wrens require food, shelter to roost, nest and seek refuge from predators in, and connecting vegetation for dispersal. In urban areas they also require humans to be aware of their needs, and if Superb Fairy-wrens are to persist in Glebe and Forest Lodge, positive actions must be taken to improve habitat and mitigate threats. With a view to achieving these aims, Table 4 below summarises recommendations made in this report for the consideration of public land managers and the City of Sydney.

<p>Recommendation 1 p. 12</p>	<p>That surveys of populations and the distribution of Superb Fairy-wrens in Glebe and Forest Lodge occur at regular intervals (at least annually) over the next five years, and preferably for 10 to 15 years. Surveys will need to include areas of public and private land as well as lands that are planted specifically for the purpose of Superb Fairy-wren habitat, to determine the success of these habitat enhancements.</p> <p>Surveys need to include data collected by residents so as to include Superb Fairy-wrens present on private land.</p>
<p>Recommendation 2 p. 17</p>	<p>That residents be discouraged from feeding any wild birds, whether intentionally or unintentionally.</p>
<p>Recommendation 3 p. 18</p>	<p>That areas of both private and public land, especially those that are intended for Superb Fairy-wren habitat, be modified to make them less attractive to Pied Currawongs. This includes ceasing of planting (and in some cases removing, especially where plants are listed as noxious or environmental weeds) trees and shrubs that produce soft, fleshy fruits, in particular <i>Celtis sinensis</i>, and with the notable exception of Lantana <i>Lantana camara</i>.</p>
<p>Recommendation 4 p. 18</p>	<p>That staff of authorities that manage public land in Glebe and Forest Lodge, including schools, as well as local residents of Glebe and Forest Lodge, be made aware, through an information and education campaign, of the habitat requirements of, and threats to, the Superb Fairy-wren.</p>

<p>Recommendation 5 p. 22</p>	<p>That residents and public land managers be encouraged to retain exotic plant species that are recognised as Superb Fairy-wren habitat on their properties, as well as to plant native shrubs, and that awareness be raised of the usefulness of Superb Fairy-wrens as a natural form of insect control.</p>
<p>Recommendation 6 p. 23</p>	<p>That the planting of honeyeater-attracting plant species such as flowering eucalypts, bottlebrushes and hybrid Grevilleas, (e.g. Grevillea 'Robyn Gordon', and Grevillea 'Superb'), and other plants with large, showy, nectar-producing flowers, (especially red and orange coloured flowers), be minimised wherever possible on both private and public lands, but particularly in identified Superb Fairy-wren habitat corridors.</p>
<p>Recommendation 7 p. 23</p>	<p>That Chinese Hackberry <i>Celtis sinensis</i> trees and seedlings be removed wherever possible from both public and private land in Glebe and Forest Lodge.</p>
<p>Recommendation 8 p. 25</p>	<p>That conservation efforts for Superb Fairy-wren habitat initially focus on the area bounded by Toxteth Road, Harold Park Paceway and Ross Street, Mansfield Street to the east and St Johns Road to the South, and that conservation efforts include both public and private land within this area.</p>
<p>Recommendation 9 p. 25</p>	<p>That residents in streets where Superb Fairy-wrens were reported in Survey 1, and in suggested corridors, be encouraged to make Superb Fairy-wren friendly gardens. Information and free plants to be distributed to residents in these areas. Consider extending this program beyond corridors as funds allow.</p>
<p>Recommendation 10 p. 25</p>	<p>That locations for plantings and habitat enhancement initially focus on areas where Superb Fairy-wrens have been sighted, and on areas that can connect these to other potential habitats.</p>
<p>Recommendation 11 p. 36</p>	<p>That residents, especially those located along corridor routes, be strongly encouraged to conserve or create Superb Fairy-wren habitat in private gardens, with education and incentives such as information campaigns and plant give-aways.</p>

<p>Recommendation 12 p. 36</p>	<p>That a Superb Fairy-wren habitat demonstration garden be created on public land in accordance with the recommendations in this report. Garden to include interpretative signage with information about Superb Fairy-wrens and their habitat requirements. Possible sites include St James Park or land beside tram sheds beside Jubilee Park.</p>
<p>Recommendation 13 p. 45</p>	<p>That the landscaping practices discussed in section 4.4, summarised in Table 3, be adopted by public land managers with responsibility for public open space wherever Superb Fairy-wrens are known to be in identified corridor areas, and that residential gardeners also be encouraged to follow these principles when maintaining or creating Superb Fairy-wren friendly gardens.</p>

Table 4. Summary of recommendations.

5.2 Conservation Plan

To provide Glebe's Superb Fairy-wrens with sufficient food, shelter, breeding opportunities, protection from predators, and connecting vegetation for dispersal, some positive actions need to be taken by residents and public land managers. Table 5 outlines a suggested conservation plan, that, if followed, will hopefully provide opportunities for these birds to persist, and increase their population size, in Glebe and Forest Lodge.

Any habitat management plan needs to adhere to the principles of firstly protecting any existing habitat, secondly enhancing potential habitat and then thirdly creating additional habitat where this is appropriate. All habitat needs to be monitored for its success in supporting the desired species, and plans need to be adapted based on the results of regular surveys.

This conservation plan, together with the recommendations summarised in section 5.1, form the basis of an integrated and adaptive management plan for the conservation of the Superb Fairy-wren population of Glebe. The persistence of Superb Fairy-wrens in Glebe and Forest Lodge depends upon several factors:

- ✦ Awareness among residents and public land managers of the habitat needs and threats to these birds;
- ✦ Minimisation of further Superb Fairy-wren habitat loss;
- ✦ Creation of new habitat areas on identified corridors to enable dispersal of female birds and establishment of new family groups;
- ✦ Mitigation of threats to Superb Fairy-wrens; and
- ✦ Regular surveys and monitoring of Superb Fairy-wren populations.

Further bird surveys, and regular monitoring of corridor areas and their vegetation, as part of an adaptive management process, is an essential part of this conservation plan. The willingness and ability of residents, both in habitat conservation and creation, and monitoring of birds, in corridor areas to also participate in a conservation program is vital to the sustainability of the Glebe and Forest Lodge Superb Fairy-wren populations.

Superb Fairy-wren conservation plan 2008-2012 and beyond

	Action	Details	Who	Priority
1.	Conduct regular surveys (at least annually) of Superb Fairy-wrens in Glebe, with community involvement.	Surveys <i>must</i> include residential gardens.	City of Sydney, The Glebe Society	Very High & ongoing
2.	Develop and implement awareness program on Superb Fairy-wrens and their habitat requirements for staff of Council and other public managers that are involved with planning, policies and maintenance of open space.	Program to include information on Superb Fairy-wren habitat needs and threats to their existence, and how landscaping design and maintenance practices affect these.	All public land managers	Very High
3.	Implement actions to mitigate threats to Superb Fairy-wrens from Pied Currawongs.	Aim to decrease amount of suitable Pied Currawong habitat, especially removal of <i>Celtis sinensis</i> and also of other plants that produce soft berries on public land.	All public land managers	Very high
4.	Enhance and infill existing landscaped areas on potential Superb Fairy-wren corridors with supplementary plantings of appropriate plant species.	Identify areas on public land where infilling and landscaping enhancement can occur.	All public land managers, with co-operation of residents	Very High

	Action	Details	Who	Priority
5.	Monitor any landscaped areas in Superb Fairy-wren corridors regularly for bird presence and plant condition.	This is the basis for an adaptive management process to ensure that Superb Fairy-wren habitat areas are in fact being used by these birds, and can be combined with regular surveys.	All public land managers	Ongoing
6.	Implement actions to mitigate threats to Superb Fairy-wrens from Noisy Miners and other aggressive honeyeaters.	Adjust landscaping policies to discourage use of plants and landscape styles known to attract Noisy Miners in areas where Superb Fairy-wrens are known to live, and corridors connecting these areas.	All public land managers	High
7.	Develop and implement public awareness campaign, to encourage residents to make their gardens Superb Fairy-wren friendly.	Campaign to include information on Superb Fairy-wren habitat needs and threats to their existence, appropriate plant species and gardening practices, and control of domestic pets. Distribute information to residents in corridor areas and offer free native plants (appropriate species only).	City of Sydney	High
8.	Post information about Superb Fairy-wren friendly gardens and appropriate plant species on City of Sydney website.		City of Sydney	High

	Action	Details	Who	Priority
9.	Create demonstration Superb Fairy-wren habitat garden with interpretative signage on public land.	Possible sites to be explored further, perhaps St James Park, or southern end part of Jubilee Park?	City of Sydney	Medium
10.	Develop 'Open Garden' scheme for residential gardens that are Superb Fairy-wren friendly.	Invite residents who have seen Superb Fairy-wrens foraging or nesting in their garden, to show their gardens to others interested in Superb Fairy-wren friendly gardens, on an open day. This could take the form of a bus or walking tour of Glebe.	City of Sydney, The Glebe Society	Low
11.	Review this plan and measure progress in 2012.	Review to include success of corridor areas and new corridors chosen if necessary.	City of Sydney, The Glebe Society	High

Table 5. Conservation Plan

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Photo: Sandy Benyon

APPENDICES

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APPENDIX A

Survey details - methodology, results and discussion

Three surveys were devised in consultation with the Glebe Society Superb Fairy-wren sub-committee to determine the current status of the Superb Fairy-wren population in Glebe and Forest Lodge.

Two of these surveys were designed to raise community awareness of the presence and needs of these birds in Glebe, as well as to involve the community in a meaningful way in collection of the data.

SURVEY 1

Survey 1 Methodology

The objective of this survey was to assist with determining the distribution of the Superb Fairy-wren in Glebe, as well as raise community awareness to the existence of these birds in Glebe, and alert residents to their likely population decline in the area, as well as ways to slow this decline.

The survey was based on a public information campaign and call for information from the community. Three thousand A5 colour flyers were printed and distributed via letterboxing, posting flyers in local shop windows, and asking local shopkeepers and community centres to accept some for picking up by interested residents. The flyer included photos of male and female Superb Fairy-wrens, and asked residents to contact a dedicated 'hotline' email address or telephone number with their sightings of Superb Fairy-wrens during September 2007, with the following information: number of male (blue) birds seen, number of female and juvenile (brown) birds seen, the address of sighting, and the type of vegetation or habitat the birds were seen in. A copy of the flyer is included in Appendix B.

A map of letterboxed areas is shown in Figure A1. Flyers were generally letterboxed to houses only, i.e. units were not letterboxed. Flyers were also distributed to Glebe Library, Glebe Neighbourhood Centre, Glebe Liquor, three local newsagents, Galluzzo's Fruit Market, at the Rozelle Community Nursery stall at Live Green in Victoria Park (event held 25th August 2007), to some of the teachers from St. Scholasticas, St. James', and Forest Lodge Primary schools, and posted to all members of The Glebe Society with The Glebe Society's September bulletin.



Figure A1. Map of streets letterboxed (houses only) with flyers for Survey 1, indicated in green. Base map sourced from Where Is www.whereis.com.au

Survey 1 results

Forty-eight responses to the flyers were received: 35 by email and 13 by telephone. Locations of birds reported in response to this survey that were sighted in spring 2007 and occurred in Glebe and Forest Lodge were mapped and are shown in Figure 1 in the main report. The raw data from this survey is included in Appendix C.

Many respondents to the survey indicated they had seen one male bird with one to three females or juvenile males. Some respondents reported one of each, and others did not provide numbers, or simply reported 'many' birds. As this data is therefore incomplete, it was estimated that an average of one male and two (or three) juvenile or female birds were seen. These numbers were not tallied as clusters of sightings probably indicate repeated sightings of members of the same small group of birds.

Where indicated by respondent, numbers of males and females/juveniles have been indicated on map. A small number of telephone responses did not indicate sex or numbers. It was assumed for these sightings that one male and one female/juvenile were seen. Where 'many' birds were reported, one male and

two females/juveniles were mapped.

The healthy response to this survey also indicates awareness of Superb Fairy-wrens among Glebe residents and the desirability of this species as a backyard bird. The map (Figure 1, main text) shows that clusters of sightings occurred around Toxteth and Boyce Lanes, Ferry Road, near Glebe Street and Jarocin Avenue and isolated sightings in one or two other spots, including Lombard Street and Campbell Lane. At least two responses from residents in Jarocin Avenue indicated that they thought that the wrens were nesting in hedges in that street.

Several responses indicated that while Superb Fairy-wrens had been seen in gardens in the past, they had not been seen for 2, 5 or more years. These reports accounted for approximately 10% of responses to Survey 1. Areas where birds were sighted in the past, but not recently, include Westmoreland Street, which may be an important, and now possibly missing, link between Glebe and Sydney University colonies of Superb Fairy-wrens.

Other recent sightings reported were from Sydney University (mostly in Physics Rd near the tennis courts, and behind Manning Building), Northumberland Rd. Stanmore (reports from these locations also indicated that there were more wrens seen, or they were seen more often, around 5 years ago than presently), and a sighting in 2003 in Johnston St. Annandale.

People who responded by email to Survey 1 were contacted to thank them for their responses and to invite them to participate a community 'snapshot survey day' on Sunday 23rd September, and to also reply if they were interested in finding out more about making their own garden Superb Fairy-wren friendly, and/or to participate in a community habitat planting day, to be held in autumn 2008. Twelve people indicated they were interested in the snapshot day (survey 3), four in making their gardens Superb Fairy-wren friendly, and seven in the planting day.

Respondents to Survey 1 who indicated they were interested in making their gardens Superb Fairy-wren friendly (10%) were posted three brochures:

- ✦ 'Superb Fairy-wrens in Glebe' snapshot day handout (Appendix D);
- ✦ 'Be a backyard buddy': Make your garden friendlier for Superb Fairy-wrens, published by NSW Department of Environment and Conservation; and
- ✦ 'Birds in your Garden: How to bring back the little ones...', published by Birds Australia and the Australian Museum.

SURVEY 2

Survey 2 methodology

This survey was designed to augment Survey 1, and was conducted over several days in August and September 2007. The survey focused on areas not covered by letterboxing in survey 1 and on areas where likely Superb Fairy-wren habitat existed. Call playback, using an MP3 player and portable speakers, and binoculars were also used in this survey.

In residential areas that were surveyed, laneways behind houses were surveyed rather than streets, as in most parts of Glebe, these streetscapes had minimal vegetation, or otherwise had street trees that seemed to be controlled by birds such as Noisy Miners, Pied Currawongs and Rainbow Lorikeets (all species that would pose a threat to Superb Fairy-wrens).

Non-residential areas surveyed included the light rail corridor (viewed on both sides from outside boundary fences and by travelling by tram) along the foreshores of Blackwattle Bay and the perimeter of Harold Park Paceway. Industrial and commercial areas were not surveyed.

Survey 2 results

This survey did not find many birds. In fact the only birds found on this survey were not found within the suburb of Glebe. A family group of birds was seen in weedy land at the corner of Brennan St and Railway Parade, on the boundary of Annandale and Leichhardt along the stormwater canal/light rail corridor.

SURVEY 3

Survey 3 methodology

Respondents to Survey 1 were invited to participate in a 'snapshot day' held on Sunday 23rd September 2007. This survey was conducted to attempt to determine the population numbers of Superb Fairy-wrens in Glebe.

Over 20 local people attended this survey, which also included an information session about the 'Secret Life of Fairy-Wrens' and workshop about identifying and surveying Superb Fairy-wrens. Participants were also informed of the results of survey 1, and shown the map of sightings reported (Figure A2).

Thirteen people stayed on after the talk to participate in the survey. Each participant was given a map of Glebe divided into 11 sections, allocated one of these sections, and were also given a data recording sheet. Each participant was instructed to survey their allocated section of Glebe on foot for one hour. Surveyors were instructed on what was likely Superb Fairy-wren habitat, and to look for vines, hedges, shrubbery, and to avoid non-likely places such as open parklands where Noisy Miners and bigger birds dominate. Participants were also played a CD of their call, and instructed how to vocalise squeaking sounds to attract birds closer.

Survey 3 results

Three to five birds were detected during this survey: a male and

female/juvenile at Toxteth Lane near Glen Lane, another male and female/juvenile in Toxteth Lane, (these two birds might have been the same ones seen twice) and a female in Jarocin Avenue.

These sightings loosely correlate with the data collected in Survey 1, in that the largest clusters of birds were reported from the area bounded by Glebe Point Road, Bridge Road, Toxteth Road and Harold Park Paceway, the area where these birds were seen.

All survey results

The total number of birds sighted in Survey 1 was over 80. The number of birds sighted in Survey 3 was three to five birds. This makes the likely number of Superb Fairy-wrens in Glebe and Forest Lodge somewhere in between these numbers, possibly 20 to 30 birds.

Discussion

Responses to the surveys indicated a good level of awareness of Superb Fairy-wrens amongst some Glebe residents, and the desirability of this species as a backyard bird. Responses also indicated that a few groups of these birds exist in Glebe, but seem to be in decline.

It is most encouraging that Superb Fairy-wrens are still present in Glebe and Forest Lodge: that they are still present in such an urbanised area after 200 years of non-Aboriginal settlement is indicative of their resilience. However, some family groups may be fairly isolated and survey results and anecdotal evidence indicate that the numbers of birds, and numbers of family groups of birds, in Glebe and Forest Lodge are in decline, although further surveys would be required to confirm this.

It was very likely that many birds sighted for Survey 1 (aimed to determine distribution of the birds) were the same birds counted several times, and that birds present in the area on the day of Survey 3 were not counted as they were on private property and only birds observable from streets and public places were counted.

Survey 1 discussion

Of the three surveys, Survey 1 accounted for most sightings of Superb Fairy-wrens. Nearly all sightings were reported from private gardens and this highlights the importance of residential gardens for Superb Fairy-wren habitat and the essential contribution the community can make to fauna surveys in residential areas. The results of this survey indicate that many residents and community members are already Superb Fairy-wren aware, and that they would like to have these birds in their neighbourhood, and are willing to take actions to ensure this species' continued existence in Glebe.

Surveys 2 and 3 did not have as much success in locating Superb Fairy-wrens, despite the use of call playback in both of these surveys (which was not used in Survey 1).

Survey 2 discussion

The results of this survey - where no birds were seen in the parts of Glebe surveyed - is further indication that most public land and open space in the area in its current state is not suitable Superb Fairy-wren habitat.

A number of factors may be contributing to this lack of birds in more public areas, including lack of suitable habitat vegetation, lack of habitat corridors to connect existing habitat patches, the presence of predatory and territorial native birds, and of predatory domestic pets. This survey did note some potential suitable Superb Fairy-wren habitat, along the Light Rail corridor and the perimeter of Harold Park Paceway, and this is discussed further in sections 4.2 and 4.3.

Survey 3 discussion

This survey was only undertaken on public land in residential streets and laneways. That only 3 to 5 birds were recorded in Survey 3 might be seen as disappointing, but may be simply an indication of this species' preference for protected domestic gardens over streetscapes and public open space.

Conclusion

The results of the three surveys, particularly results from Survey 1, indicate that the main stronghold for Superb Fairy-wrens is around the western end of Boyce Street and Boyce Lane, extending south as far as Jarocin Avenue, and that there are also (possibly smaller) groups of birds in several locations east of Glebe Point Road.

That around 10% of respondents to Survey 1 noted that they used to see Superb Fairy-wrens in their gardens, but no longer do, is a strong indication that the Glebe Superb Fairy-wren population has been in decline over at least the past 5 years and possibly over the past 20 years. Possibly many more residents have also noted this, as the survey only asked for current sightings to be reported, and/or this has also occurred in the gardens of other residents without their awareness.


This anecdotal evidence may indicate that Glebe's Superb Fairy-wren populations may be headed for extinction, and are very likely to be in decline. Superb Fairy-wrens can have a life-span of up to 20 years, and further research is needed to determine population trends, particularly over the next 5 years, and up to 20 years.

While a family group of Superb Fairy-wrens can survive in a fairly small area, if habitat requirements are met, connectivity among territories is essential for dispersal and breeding in the medium to long term. Research conducted in Canberra⁵ has indicated that around 75% of Superb Fairy-wren chicks are not



⁵ Double M, & Cockburn A, 2000. Pre-dawn infidelity: females control extra-pair mating in superb fairy-wrens. *Proceedings of the Royal Society London B*, **267**: 465-470.

fathered by a member of the family group, and once fledged, female birds are expelled from the family group to find new territory. This means it is absolutely essential for the persistence of Superb Fairy-wren populations that territories are connected to each other, and that these connections allow birds to travel among territories safely (and Superb Fairy-wrens are well-known to be weak flyers). If territories are not thus connected, populations will decline to extinction very rapidly, perhaps in 5 to 10 years.

APPENDIX B



**Have you seen
any of these birds?**

male ▲ female ▶

SUPERB FAIRY WRENS
(ALSO KNOWN AS 'BLUE WRENS')

Please tell us about it!
- see over for details

Thanks to K Yang and W Pabrowka @ Bird Explorers for permission to use their photographs

**Glebe and Forest Lodge Community
'Superb Fairy Wren' Survey
September 2007**

These wrens are disappearing from Glebe and Forest Lodge and so we're surveying existing groups to help improve their habitat.

If you've seen these birds, please email details of your sighting to -

glebe.wrens@gmail.com

... and tell us:

- address or approximate location of sighting
- number of birds
- colour of birds (blue or brown), and
- where you saw them (in a tree, a shrub or on the ground)

For more info and to hear the call of this bird, visit the Glebe Society at
www.glebesociety.org.au
- or phone 9552 4172



CITY OF SYDNEY ENVIRONMENTAL GRANTS PROGRAM
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APPENDIX C

Survey 1 raw data of Glebe Superb Fairy-wrens spring 2007

Street/Road	Nearest Cross St	No of Males (blue/breeding plumage)	No of Females/ Juveniles (brown)	Habitat	Comments
Boyce Lane	also Toxteth Lane	1	1	climbing rose, camellias, orange tree	
Boyce St		1	2 to 3	Lilly pilly, Camellias	
Boyce St		1 to 2	3 to 4	Garage roof...rose bush, on ground	constant neighbours for many years---have noticed increase in Currawongs in recent years....invading nests of Bul-buls
Boyce St					continuous over last 13 years
Boyce St					heard, not yet seen
Boyce St		1	1	camellias, on grass	mating pair
Boyce St	in shrubbery between Toxteth Estate and Harold Park	1	>1	shrubby - esp. callistemons in Boyce St street trees	
Boyce St				biodynamic, balanced garden. Small trees and lawn and cats that go outside. Wrens in neighbouring citrus tree	
Boyce St.		1	>1	ivy and other bushes	in 2005 we had a nest in a hanging basket in the courtyard.
Campbell St		1	>1		

Street/Road	Nearest Cross St	No of Males (blue/breeding plumage)	No of Females/ Juveniles (brown)	Habitat	Comments
Campbell St	also alley ways between Glebe & Campbell and Campbell and Glebe Point Rd with St Johns Road & Mitchell St Boundaries.	1	>5	native grasses, rosemary, climbers	other birds
Ferry Rd		1	1	herbs, curry tree	pair last summer
Ferry Rd		1	1	fruit trees	less often in the past 5 years
Ferry Road		1	1	in next door vines	
Ferry Road	towards the bay	2	3		2 taken by cat
Forsyth St	bottom of Forsyth St near water	1	0	eucalypt	
Hereford St		1		heard not sighted	
Hereford St			1		2 females and a male previously
Hereford St		1	>3	honeysuckle, nandina	eggs attacked by bulbuls
Jarocin Ave		1	>1	shrubs, trees	
Jarocin Ave		1	1	in hedge	
Jarocin Ave		1			
Jarocin Ave		1	1		
Jarocin Ave		1	3	banksia rose - nest?	come every year
John St., near Park		A few	A few	In a citrus tree in her garden.	
Lombard St		1	>1	big shrubs including mock orange, jungly courtyard garden, only trees are 2 tall weeping elms, lilly pilly nearby	a family
Mansfield St			2	Manchurian pear trees	not seen recently, currawongs around
Mansfield St		1		seen in jacaranda	previously 4-6 regular visitors, but seems to have disappeared with increase in cats in the area.

Street/Road	Nearest Cross St	No of Males (blue/breeding plumage)	No of Females/ Juveniles (brown)	Habitat	Comments
St Johns Road	near Nags Head Hotel	1	1	in tree	
Sydney Uni	behind Manning Building	>2	>3	shrubs between courtyard and tennis courts	
Sydney Uni	Physics Road near the tennis courts	1	2	between 2 hedges - one a gardenia	
Sydney Uni	shrubs alongside tennis courts	1 to 2	3 to 4	low shrubs and rose bushes	fewer than there used to be
Sydney Uni	tennis courts in centre of SU campus	>1	>1	small bushes and shrubs	maybe 5 or 6 families of 5 -7 birds
Taylor St	in school yard next to bay overlooking fish markets, also in house garden along new foreshore walk	1	1	in undergrowth under casuarinas beside harbour	other birds
Toxteth Rd					feed on insects from worm farm also in Lilly Pilly hedge
Wigram Rd	Bell St	1	1	orange tree & jasmine	In mixed flock of about 6-8 bulbuls and some sparrows.
Wigram Road		1	3		

Superb Fairy-wrens in Glebe

Superb Fairy-wrens prefer safe, protected gardens over larger parks and open spaces. Their diet consists mostly of insects and they like to forage for insects on lawns and in shrubs.

You can start with making your garden Superb Fairy-wren friendly, or take the next steps to create a Superb Fairy-wren habitat garden.

If you have a lawn with some dense shrubs nearby for them to take refuge in, this is an excellent start to providing a good Superb Fairy-wren habitat.



SUPERB FAIRY-WREN FRIENDLY GARDEN

You can make your existing garden more Superb Fairy-wren friendly by understanding their needs and taking a few simple actions.

Try to leave part of your garden 'untidy'. Avoid major pruning or clearing in the parts of the garden you have seen the Superb Fairy-wrens using. Instead of cleaning up or throwing out leaf litter, use it on the garden as mulch.

Avoid using pesticides in the garden (even the 'natural' ones). If you provide a safe environment for them, Superb Fairy-wrens will take care of most garden insect pests for you!

Minimise the number of plants that have showy red and orange nectar-producing flowers, such as hybrid grevilleas, bottlebrush and eucalypts, as these may attract aggressive honeyeaters, such as Noisy Miners, that will chase the Superb Fairy-wrens away and may even attack them.

Minimise the number of plants that have small fruits, such as lilly-pillies, cotoneasters and privets, as these can attract predatory birds such as Currawongs.

Keep pets indoors. Cats need to be kept indoors at all times, but particularly around dawn and dusk. Adding a bell to a cat's collar is not sufficient protection for small birds. Alternatively, install a fenced 'cat run' in your yard. Pet food left outside will also attract predatory birds.

Avoid providing food handouts for any birds.

Talk to your neighbours about making their gardens Superb Fairy-wren friendly.

SUPERB FAIRY-WREN HABITAT GARDEN

Plant for food, Plant for shelter.

Native shrubs that produce small white, cream or yellow, and often strongly scented, flowers such as **tea trees, wattles and hakeas** make great Superb Fairy-wren habitat. These plants attract insects, providing food for Superb Fairy-wrens and can also provide shelter. When choosing native plants, aim to plant locally indigenous species, as these plants are suited to local conditions. Local **community nurseries** stock local native plants.

Non-native plants can also be good. Around Glebe, Superb Fairy-wrens have been seen in camellias, citrus trees, roses (especially climbing roses), bougainvilleas and plumbagos. Superb Fairy-wrens will enjoy gleaning the scale from your lemon trees and aphids from your roses!

Climbing plants, such as the native Wonga Wonga Vine, are also good. Allowing a climber to twine over shrubs, trellis or a mesh wire fence can create a secure haven for Superb Fairy-wrens to take refuge from predators such as cats and larger, carnivorous birds such as Currawongs and Ravens. If you are lucky, the wrens may build a nest in your climbers.

Note that plants promoted by commercial nurseries as 'bird attracting' are often nectar-producing plants such as eucalypts and grevilleas that attract honey-eaters, including the aggressive Noisy Miner, and are not recommended for Superb Fairy-wren habitat.



PLANTING TIPS

Plant for vertical and horizontal structure and density. Simplified garden structure and design may seem convenient, but it reduces the volume and variety of food and shelter for Superb Fairy-wrens.

Plant shrubs close together and in groups. Several shrubs close together can form dense, protective thickets, great habitat for Superb Fairy-wrens. Once shrubs are mature, you should not be able to see through to the other side. Blocks of plants will work better than rows.

'Tip pruning' will help plants to become denser and bushier. Tip pruning can be done at any time of year. A light clipping with hedge shears can also work well.

Variety is also important, try to choose a few species, using at least 3 or 5 plants of each.

Allow vines to climb over shrubs. Grow rambling, light climbers in amongst medium to tall shrubs and trees, to give extra shelter and possible nesting sites. Generally this will not harm the supporting plant (unless immature) and will add extra density and complexity to the vegetation. Climbers trained over a trellis or mesh fence can also work well - the birds can escape through the mesh to the other side of the fence to get away from a predator.



Provide a bird bath

All birds need water. A constant supply of fresh clean water in your garden will attract Superb Fairy-wrens as well as other birds. Bird baths need to be shallow and rough inside so birds feel safe.

Bird baths need to be placed close to shrubs where birds can quickly retreat to safety, but can still see if predators approach. A hanging bird bath can work well, provided it is accessible for cleaning and topping up. Keep bird baths away from windows.

Where to find out more

About Superb Fairy-wrens

<http://www.birdsinbackyards.net/finder/display.cfm?id=3>

http://www.aronline.net.au/factSheets/superb_fairy_wren.htm

<http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Make+your+garden+friendlier+for+superb+fairy-wrens>

About habitat gardens

<http://www.birdsinbackyards.net/spaces/designing-a-garden.cfm>

Local plant lists

<http://www.cityofsydney.nsw.gov.au/Environment/documents/CoSNativePlantList.pdf>

<http://203.147.135.212/Environment/documents/plantlist.pdf>

<http://www.ramin.com.au/annandale/veg-bib.shtml>

Nurseries supplying local native plant species

http://www.homer.com.au/projects/splash/html/resource/supplying_vegetation.html#inner%20western

What happens next?

This project is the first action in a 5-year plan to conserve Superb Fairy-wrens in Glebe. Please continue to look out for Superb Fairy-wrens in your neighbourhood, and make all efforts you can to make your garden Superb Fairy-wren friendly. You can continue to report your sightings to <http://www.birdsinbackyards.net/surveys/superb-fairy-wren.cfm>

Prepared by Sue Stevens, September 2007. Please contact glebe.wrens@gmail.com for permission to reproduce.

Reference: Birds In Backyards, Australian Museum 2005.

This project is an initiative of The Glebe Society and has been funded by the City of Sydney environmental grants program.



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APPENDIX E

Suggested local native plant species for Superb Fairy-wren habitat

Thanks to some dedicated research from some of Sydney's botanists and bush regenerators, we now have a fairly comprehensive guide to the native plants that grew in Sydney's inner west prior to white settlement.

The following table has been compiled with reference to those lists, and from the author's own knowledge and expertise, and focuses on plants suitable for Superb Fairy-wren habitat, including food and shelter plants.

The plants listed are thought to have been indigenous to inner-western Sydney prior to white settlement. Emphasis in this list is on plants that should be fairly easily obtainable, but a few that may be difficult to obtain at present, such as Epacrids and some Peas, and plants such as Epacrids have traditionally been difficult to propagate, have been included to indicate the variety of plants that are suitable for Superb Fairy-wren habitat, and with a view that these plant species may be available in the future. Indeed, highlighting them as suitable small bird habitat may influence some nurseries to add them to their stocklists.

Botanical Name	Common Name	Height (m)
Paperbarks		
<i>Melaleuca armillaris</i>	Bracelet Honeymyrtle	5
<i>Melaleuca decora</i>	a Paperbark	7
<i>Melaleuca ericifolia</i>	Swamp Paperbark	8
<i>Melaleuca linariifolia</i> *	Snow-in-summer	8
<i>Melaleuca nodosa</i> ^p	Ball Honeymyrtle	6
<i>Melaleuca styphelioides</i> * ^p	Prickly-leafed Paperbark	10
Tea-trees		
<i>Leptospermum squarrosus</i> *	Pink Tea tree	3
<i>Leptospermum polygalifolium</i> *	Lemon-scented Tea tree	3
<i>Leptospermum trinervium</i>	Paperbark/Slender Tea-tree	4
Wattles		
<i>Acacia binervia</i>	Coast Myall	4
<i>Acacia falcata</i>	Sickle Wattle	3
<i>Acacia fimbriata</i> *	Fringed Wattle	3
<i>Acacia floribunda</i> *	White Sally Wattle	4
<i>Acacia implexa</i>	Hickory Wattle	8
<i>Acacia linifolia</i> *	White Wattle	3

Botanical Name	Common Name	Height (m)
<i>Acacia longifolia</i> *	Sydney Golden Wattle	4
<i>Acacia parramattensis</i>	Parramatta Black Wattle	5
<i>Acacia terminalis</i>	Sunshine Wattle	2
<i>Acacia ulicifolia</i> ^p	Prickly Moses	2
Hakeas		
<i>Hakea dactyloides</i>	Finger Hakea	2
<i>Hakea salicifolia</i>	Willow-leaved Hakea	5
<i>Hakea sericea</i> ^p	Needlebush	3
Grevilleas		
<i>Grevillea buxifolia</i>	Grey Spider Flower	1.5
<i>Grevillea linearifolia</i>	White Spider Flower	2
<i>Grevillea mucronulata</i>	Green Spider Flower	1.5
<i>Grevillea sericea</i>	Pink Spider Flower	1.5
<i>Grevillea speciosa</i>	Red Spider Flower	1.5
Daisy Bushes		
<i>Cassinia aculeata</i>	Common Daisy Bush	1.5
<i>Cassinia aureonitens</i>	Yellow Daisy Bush	2
<i>Olearia microphylla</i>	Bridal Daisy Bush	1.5
<i>Olearia viscidula</i> ^t	Viscid Daisy Bush	2
<i>Ozothamnus diosmifolium</i>	Sago Bush	2
Peas		
<i>Daviesia corymbosa</i>	Clustered Bitter Pea	1
<i>Daviesia retorta</i>	Eggs and Bacon	1
<i>Daviesia ulicifolia</i> ^p	Gorse Bitter Pea	0.5
<i>Podolobium ilicifolium</i> ^p	Prickly Shaggy Pea	2
<i>Pultenaea elliptica</i>	Bush Pea	1
<i>Pultenaea stipularis</i>	Bush Pea	2
<i>Pultenaea villosa</i>	Bronze Bush Pea	1
<i>Pultenaea daphnoides</i>	Bush Pea	2
<i>Pultenaea retusa</i>	Blunt Bush Pea	1
<i>Pultenaea linophylla</i>	Halo Bush Pea	1
Heaths		
<i>Epacris longiflora</i> ^p	Fuchsia Heath	1
<i>Epacris pulchella</i> ^p	NSW Coral Heath	1
<i>Epacris purpurescens</i> ^p	Port Jackson Heath	1
<i>Leucopogon ericioides</i> ^p	Pink Beard Heath	1
<i>Leucopogon juniperinus</i>	Prickly Beard Heath	1
<i>Lissanthe strigosa</i> ^p	Peach Heath	0.5
<i>Monotoca elliptica</i> ^p	Tree Broom-Heath	3
<i>Styphelia laeta</i>	a Five Corners	1
<i>Styphelia tubiflora</i> ^p	Red Five Corners	1
Other shrubs and small trees		
<i>Baeckea linifolia</i>	Weeping Baeckea	1.5

Botanical Name	Common Name	Height (m)
<i>Bursaria spinosa</i> **p	Australian Blackthorn	4
<i>Callitris rhomboidea</i>	Port Jackson Pine	3
<i>Ceratopetalum gummiferum</i>	NSW Christmas Bush	4
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum	4
<i>Correa reflexa</i>	Common Correa	1
<i>Goodenia ovata</i>	Hop Goodenia	1
<i>Kunzea ambigua</i> *	Tick Bush	3
<i>Lomatia silatifolia</i>	Crinkle Bush	1
<i>Pimelia linifolia</i>	Slender Rice Flower	1
<i>Pomaderris feruginea</i>	Rusty Pomaderris	2
<i>Pomaderris sieberiana</i>	Sieber's Pomaderris	2
<i>Prostanthera incana</i>	Hoary Mint Bush	1
<i>Zieria smithii</i>	Sandfly Zieria	2
Climbers, scramblers & twiners ^c		
<i>Clematis aristata</i>	Old Man's Beard	
<i>Clematis glycinoides</i>	Old Man's Beard	
<i>Eustrephus latifolius</i>	Wombat Berry	
<i>Hardenbergia violacea</i>	False Sarsparilla	
<i>Hibbertia dentata</i>	Guinea Flower	
<i>Hibbertia scandens</i>	Snake Vine	
<i>Kennedia rubicunda</i>	Dusky Coral Pea	
<i>Pandorea pandorana</i> **	Wonga Wonga Vine	
<i>Platylobium formosum</i>	Handsome Flat Pea	
Grasses, sedges, reeds & rushes		
<i>Carex inversa</i>	a Sedge	0.5
<i>Gahnia sieberiana</i>	a Sedge	2
<i>Juncus kraussii</i>	Sea Rush	1.5
<i>Juncus continuus</i>	a Rush	1
<i>Poa affinis</i>	Tussock Grass	1
<i>Phragmites australis</i> **	Common Reed	4
<i>Schoenus apogon</i>	Common Bog-rush	0.25
<i>Schoenus brevifolius</i>	a Bog-rush	0.75
<i>Schoenus melanstachys</i>	a Bog-rush	1
<i>Typha orientalis</i>	a Bulrush	2

Legend:

- * recommended
- ** highly recommended
- c - most robust climbers can reach 2m with support
- p - prickly
- t - thicket forming

Notes:

1. When choosing plants for small bird habitat:
 - ✦ it is important to have a diversity of plant species in any revegetation project, but especially for small bird habitat, as a diversity of plant species will attract a diversity of insect food.
 - ✦ for Superb Fairy-wren habitat it is essential to have vegetation, or at least patches of vegetation, that reach all the way to the ground.
2. Heights listed below are maximum heights that can be attained under ideal growing conditions, and many species will not reach these heights under cultivation.
3. Certain plant species are attractive to bird species that are unsuitable for sharing Superb Fairy-wren habitat. The omission of certain plant species from this list - such as eucalypts (popular with Noisy Miners - an aggressive honeyeater species) and plants that produce small fleshy berries (popular with Currawongs - a major predator of small birds) - is just as important, if not more so, as the inclusion of others. For example, underplanting a stand of eucalypts with species recommended as Superb Fairy-wren habitat may merely attract the wrens into an unpleasant and possibly fatal situation, or just not attract them at all.
4. Prickly plants are often recommended for use in Superb Fairy-wren habitat plantings. I recommend that prickly plants be used as barriers around plantings - to keep out predators such as cats, but it is my opinion that thorny (with well-spaced thorns), rather than prickly, plants are more suitable for Superb Fairy-wren retreats. As there are few plants indigenous Sydney's inner-west, with the exception of Blackthorn *Bursaria spinosa*, a number of thorny exotic plant species, such as climbing roses and bougainvilleas have been recommended in the exotic section of this plant list. This emphasises that many plants already existing in residential gardens are suitable for Superb Fairy-wren habitat, and residents to not have to remove all their garden plants and 'start again' with natives to have valuable Superb Fairy-wren habitat gardens.
5. Wattles are often short-lived species, and while they are also often quick-growing, therefore quickly developing habitat, they need to be combined with other, slower-growing species.
6. Soils and geology information was not included in these lists as it is likely that most of Glebe's soils would have been substantially altered since the commencement of white settlement in the area. However, plants noted for their occurrence in rainforests, gullies and moist soils have mostly been omitted.

References:

Rozelle Bay Community Nursery. *City of Sydney Native Plant List* accessed 7/9/07.
URL: <http://cityofsydney.nsw.gov.au/Environment/documents/CoSNativePlantList.pdf>

Ondinea D, 1998. *Wildlife Habitat Plants of Orphan School Creek Gully and adjacent areas*. unpublished.

Robinson L, 2003. *Field Guide to the Native Plants of Sydney*. 3rd edn. Kangaroo Press.

Royal Botanic Gardens Sydney Plantnet accessed 8/11/7
URL: <http://plantnet.rbgsyd.nsw.gov.au/search/florasearch.htm>

APPENDIX F

Habitat planting example

Habitat planting example - suitable for a small park or large garden.

Core area:

- ✦ **Shrubs 2-4 m** - e.g. wattles, tea-trees and paperbarks, dense but not too prickly;
- ✦ **Twiners, climbers** - e.g. wonga wonga vine, over fence, shrubs and ground. Thorny species can be useful;
- ✦ **Ground layer**, a combination of herbs, leaf litter; and
- ✦ **Reeds and tall grasses**, e.g. *Phragmites* and *Typha* these are especially good for moister areas, as are some of the Paperbarks, eg. *Melaleuca styphelioides*.

Perimeter:

- ✦ **Shrubs 0.5-1.5m** - e.g. some hakeas, peas, prickly acacia species and heaths around edge. Prickly species are best used in this part of the landscape as this will deter cats (and people!) from the core area;
- ✦ **Ground layer, and grasses.**

Foraging Lawn:

- ✦ Small areas of lawn close to the safety of shrubs support efficient foraging and quantity and variety of food.

Superb Fairy-wrens prefer this dense, varied structure to beside an open area of lawn. This way, they can forage on the lawn for insects and retreat to the safety of the dense shrubbery when protection is needed. A 'keyhole' shaped lawn offers escape from predators in more than one direction.

Note: While this example promotes the use of a range of plant habits and sizes, a notable omission here is tall trees, as these may attract predatory and territorial species. Recent field surveys by the author in inner-western and inner south-western Sydney found more small birds, including Superb Fairy-wrens, in habitats that had the bulk of the biomass in shrubs 2-3 m high.⁶

⁶ Stevens SJ, 2007. Small birds in the urban landscape: what types of vegetation are suitable habitat? Unpublished Masters thesis, University of New England, Armidale.