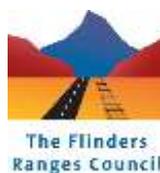


# **Action Strategy for the Little Corella** *Cacatua sanguinea* 2015-2019



**Prepared by Patrick Hodgens for**  
**The Flinders Ranges Council**



## Executive Summary

The Little Corella *Cacatua sanguinea* is a native Australian parrot from the Cockatoo family. This species has benefitted greatly from the changes to the landscape of Southern Australia which has been brought about by broad scale pastoral practices. These practices have resulted in a substantial increase in food and water resources and subsequently, the species has increased in both range and abundance. In many areas in rural and in some cases suburban areas in Southern Australia, large flocks of these parrots descend on private properties and often in townships where they can cause a multitude of issues to the local environment, economy and well-being of residents.

The Little Corella has been present in the Flinders Ranges for approximately 80 years and over the past decades large flocks of the birds have descended on the rural townships of Quorn and Hawker each summer. The birds are causing a multitude of issues in these townships, with community members being particularly concerned over the defoliation and damage being caused to the large and old River Red Gums *Eucalyptus camaldulensis* in and along the riparian area of the Pinkerton Creek in Quorn.

Over the years there have been several community meetings which culminated in 2012 when The Flinders Ranges Council Little Corella Control Reference Committee was formed. Local landowners and active members of the Committee have attempted a variety of management strategies to alleviate the Corella issue with varying levels of success.

The Flinders Ranges Council gained funds through the Northern and York Natural Resource Management Board to investigate best practice Little Corella management and to develop a Management Plan for The Flinders Ranges Council District encompassing 2015-2019.

The Flinders Ranges Council currently has limited funds to implement the management actions of the plan and it is unknown if funds will become available in the short to medium term. Subsequently, the plan outlines educational methods to engage members of the community in active Little Corella management.

Several lethal and non-lethal Corella management options are discussed in the plan.

The most widely accepted and most effective strategy to discourage Little Corellas from priority areas is to prevent the large flocks of the birds establishing a permanent roost site once they complete their breeding season. This involves careful monitoring and vigilance of the birds and implementing deterrence strategies as soon as the first scout birds arrive in the townships. A combination of sound and sight deterrence strategies is to be used in The Flinders Ranges Council area to ameliorate the negative impacts of large Little Corella flocks. It is widely accepted that localised large scale culling of large numbers of individuals from a Little Corella flock is not an effective strategy to combat the issue. This is largely due to the

dynamic nature of flocks, with individuals from nearby flocks across the landscape regularly emigrating and immigrating through sub populations. However, this Action Strategy recommends that scout bird pairs bonds be broken by the shooting of one individual from each pair. This may prevent birds from establishing roost sites in the area and also could prevent other birds settling in the area. The strategy recommends conservative and strategic culling of corellas when they enter the townships.

Importantly, this plan acknowledges that by discouraging and displacing Corella flocks in Quorn and Hawker the flocks may then become an issue in neighbouring townships. This issue is central to the management of Little Corellas in South Australia and can only be addressed by landscape scale strategies implemented across the state.

The Local Government Association of South Australia (LGA) is currently undertaking a long term study of best practice Little Corella Management in conjunction with Adelaide University. The study will culminate in a state-wide management plan for the Little Corella. The LGA suggests that until this study is completed, all local councils undertaking Little Corella management should focus on their own localised areas.

This adaptive management plan outlines monthly timelines for deterrence strategies and has inbuilt mechanisms for regular monitoring and evaluation.

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## 1.0 Aim

The aim of this action strategy is to reduce the negative impacts that Little Corellas are inflicting within The Flinders Ranges Council district. Specifically the strategy aims to reduce the impacts this species is having on the two townships of Quorn and Hawker especially areas of significance such as the Pinkerton Creek in Quorn.

It is acknowledged that the management actions prescribed in this strategy are likely to be successful in dispersing the species out of the two townships, potentially moving problem flocks to other areas and nearby townships. The larger scale problem of Little Corellas across the South Australian landscape is being addressed by a long term study within the Local Government Association.

## 2.0 Background

### 2.1 Study Area

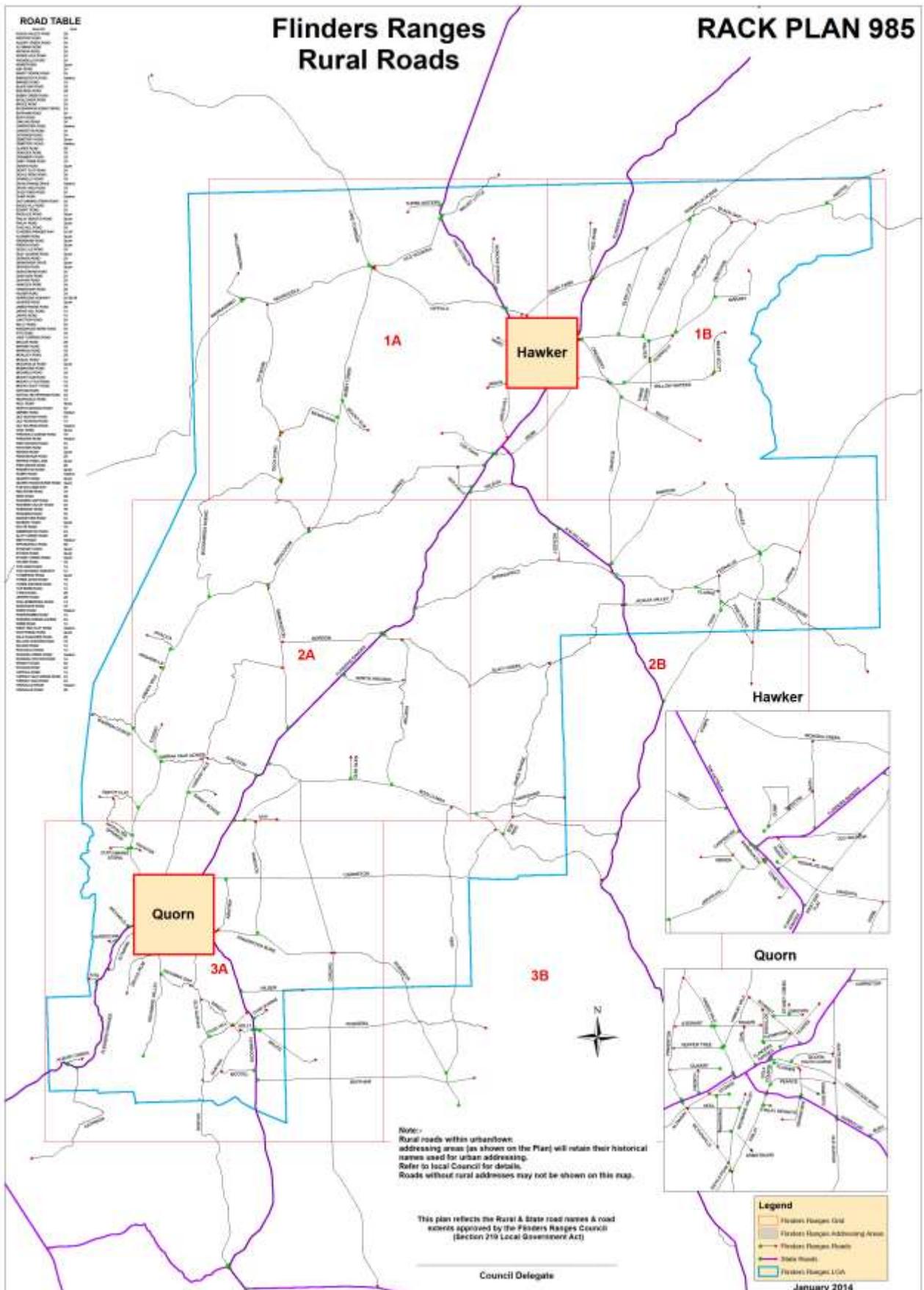
The Flinders Ranges Council District (**Map 1**) encompasses an area of 4,198 square kilometres from Mount Brown Creek and Pichi Richi Pass in the south to Arkaba in the North. Quorn and Hawker are the two main townships in the region, with Cradock also being within the Council district. The main land use of the area is sheep grazing and wheat farming. The Eastern edge of the Council district also abuts the Flinders Ranges National Park.

### 2.2 Little Corella Issues in Area

Historically, the Little Corella's southern range extent was north of The Flinders Ranges Council district. Several elderly residents of the region remember the first few Little Corellas that entered the region in the 1930's-1940's when they were children (Peter Slattery pers comm.) Some of the residents distinctly remember being pulled out of school to have a look at the 'White Cockatoos' that were new to town. These were undoubtedly some of the first Little Corellas to arrive in the region. Initially the numbers of the species were low but over the years the population of Little Corellas increased dramatically. Since at least the 1950's (St John, 1991) very large flocks of Little Corellas have descended on the two largest townships in the Council district of Quorn and Hawker. Public concern over the impacts the species were having on the Quorn township was raised as early as 1953 (St John, 1991).

In 1991 it was stated that there were between 40,000 and 60,000 birds in The Flinders Ranges Council region (St John 1991). There is no accurate population estimate of the Little Corellas in the region currently, however in summer the large flocks of tens of thousands of

(Map 1) Flinders Ranges Council Area



birds cast large shadows across the land as they fly over the townships (Peter Slattery pers comm).

It is not known why the birds arrive in Hawker and Quorn each year. There are several creek lines in between the two townships which are not affected by the Little Corellas. These creeks are on active pastoral land, so surface water in the form of stock watering points are also available to the birds. There is certainly something about the townships that drive the birds to these areas each year.

The primary concern for community members in Quorn is the damage that the birds are inflicting on old River red gums *Eucalyptus camaldulensis* in the Pinkerton Creek. Here large flocks of the birds roost during the summer months. At these roosts, the trees are defoliated as the birds chew the leaves, buds, bark and the branches of the trees. Constant pruning of the trees affects the overall health of the tree which can result in the death of the tree in extreme cases. Often the trees have their canopies totally defoliated each summer which results in the death of the larger upper limbs of the tree, giving these large eucalypts a stunted appearance. Some of these branches can reshoot during the autumn, winter and spring when the congregations of birds disperse, however the return of the Little Corellas coincides with peak growth time for the gum trees. Subsequently, any regrowth is quickly browsed off by the birds.

Many other trees are also damaged throughout the townships of Quorn and Hawker, with regular browsing occurring wherever the birds land. This results in community members and Council having to constantly clean up after the birds. To a lesser extent, some damage occurs to peoples properties and farming equipment.

Secondary to the environmental and property damage is the social impacts that the birds have on community members of the Council district. The large congregations of Little Corellas are extremely noisy, especially at dusk and dawn and this can impact severely on those people residing near the day and night roosts of the birds. The constant noise associated with large Corella roosts has been linked to peoples mental health in terms of stress, anxiety and depression (Alexandrina Council 2011). Residents that live near these roosts also have legitimate concerns about the rainwater tanks being contaminated by the birds faeces. Town residents generally are annoyed by the faecal matter on their property, including washing lines, vehicles and outdoor furniture.

In the Alexandrina Council Region in South Australia, studies of Little Corella aggregations has shown that the noise level emitted by the birds exceeds the health limit set by the World Health Organisation (WHO) (Alexandrine Council 2011). It is likely that the large Little Corella flocks that descend on Quorn and Hawker also would exceed WHO levels.

### 2.2.1 Little Corella issues in Hawker

In Hawker, the damage caused by Little Corella flocks is centred around a few key areas. The first few scout birds arrive in town around September or October and steadily gather in numbers in the following weeks. The birds roost at night in creek lines approximately 5km's to the South of Hawker. At first light the birds descend on Hawker, landing in trees in a variety of locations across the town.

The flocks gather along in the Eucalypts that grow along the vegetation strip along the main Flinders Way (formerly Hawker-Leigh Creek Road). Large flocks also congregate in the large trees in the park around the Railway Dam. A medium sized Fig tree that had been planted in the park near the railway dam was regularly defoliated by the birds. This tree was entirely covered by bird netting in order to protect it from Little Corellas. This method worked successfully.

Other areas that are affected by the birds include the Southern section of town around the school and hospital and to the West of town at the racecourse (**Map 2**).

The birds have stripped many of the large Eucalypts that they land in and create a noise nuisance, particularly around the school and at the hospital where their presence is noticed. Birds also cause a nuisance throughout the township where they land in large trees, including pine trees.

The flocks stay in the area until around midday when they depart potentially for feeding or to a diurnal roost outside of town. The large flocks then arrive back in Hawker to the same areas in the mid to late afternoon before returning to their nightly roost sites at dusk. It is likely that the birds feed on fallen grain across the cropping lands to the North and West of the Hawker township.

During peak times, the birds cause damage to many of the trees across the town and cause noise pollution throughout the entire township. The birds also cause damage to the grass oval at the Hawker School and have also recently damaged the synthetic lawn at the Bowling Club through chewing. The birds do not appear to be causing significant damage to housing, wiring or vehicles at this stage.

The flocks depart Hawker when the first rains arrive in autumn, around May and June. It is not believed that there is a resident population of Little Corellas around the township of Hawker.



— Current areas affected by Little Corellas

Source : Google Earth, accessed 23/2/2015

**(Map 2)** Hawker Map, displaying areas mostly affected by Little Corellas

### 2.2.2 Little Corella issues in Quorn

Similarly to Hawker, in their peak densities, the Little Corella flocks affect much of the township by ways of noise pollution and defoliation of trees.

In Quorn it is likely that there is a small resident population of potentially 200 birds (Gary Lucas personal comment) that stay over winter. These birds are more than likely breeding in Eucalypt hollows in nearby creek lines. Each September and October this small resident population is joined by tens of thousands of birds which form night roosts on the outskirts of the township. Currently the birds have two main night roosting locations, one out on the Stoney Creek to the East of Quorn and another to the South of town in the Richman Valley.

The birds arrive in Quorn after day break after they leave the nightly roosting sites. The birds then congregate in town until they depart in the late afternoon. It is assumed that the birds feed in nearby cropping fields during the mornings and afternoons.

The main areas that have been affected by the Little Corellas in Quorn are primarily focussed around the Pinkerton Creek, where the birds have stripped many of the large River Red Gums of foliage. Large flocks also regularly congregate in the riparian vegetation of the Stoney Creek, particularly around the Colebrook Community. Due to the success of the management actions in the Pinkerton Creek, large numbers of birds congregate on privately owned land to the West of town (**Map 3**).

Prior to the management actions employed by the Quorn Caravan Park and The Flinders Ranges Council, the flocks regularly roosted in the Pinkerton Creek.

### 2.3 Little Corella Ecology

The Little Corella *Cacatua sanguinea* is a small white cockatoo which grows between 35-39cms (Pizzey and Knight 2001). The species is widespread across Australia and occurs in every State and Territory. It is accepted that the range of the Little Corella is expanding toward the coast in Southern and Eastern Australia. It is considered a habitat generalist and is found across a multitude of land systems across its wide distribution. Nationally the species is considered common to very abundant.

The species breeds in tree hollows along tree lined rivers and creeks or in cavities in cliffs where 3-4 eggs are laid in the breeding season between August and October.

Little Corellas are a long lived species, with captive individuals living in excess of fifty years. In the wild it is likely that the life expectancy of the birds is less than this but still considerable. Cockatoos are also renowned for their intelligence, therefore being



- Historical and current areas impacted by Little Corellas
- Current roost site of least concern
- Proposed future roost site of least concern

Source : Google Earth, accessed 23/2/2015

(Map 3) Quorn Map, displaying areas mostly affected by Little Corellas

long lived and intelligent it is likely that these birds have a good memory for appropriate roosting sites and feeding zones and may return to these sites year after year.

Like other members of the cockatoo family, the Little Corella utilises its loud vocalisations to regularly communicate with other members of its family and wider flock. Birds in a flock will regularly communicate through contact calls as well as alarm calls. Pair and family bonds are reaffirmed each night and evening through raucous vocalisations when the birds land in roost trees at dusk and as they wake at dawn.

Little Corellas are also very strong fliers and can travel large distances in short spaces of time as they search for food, water, nesting sites or the safety of a larger flock.



**(Left)** Little Corella resting in the canopy of a Eucalypt.

## 2.4 Little Corella Behaviour

Between late May and early September, Little Corellas are generally seen spread out across the wider landscape in either pairs or small family groups while breeding takes place. Once the young have fledged, the adults and young join other small family groups and form large 'super flocks'. Like most flocking or herding species, the primary reason for this behaviour is

to increase individual safety. An individual's chances of being killed by a predator are greatly reduced in a flock or herd. This is particularly useful when feeding on the ground, entering an open area to drink ground water or perching up a tree at night. The flocking behaviour is also likely to be very useful for the young corellas as they learn the best places to feed, drink and shelter, learn social dynamics and also to find mates.

These summer flocks often congregate in rural townships in South Australia. Reasons why are not entirely clear, but it is likely to be due to a combination of factors. The birds may roost in and near townships as they know there is plentiful water nearby, whether it be from sewerage ponds, dams, stock troughs, garden ponds, bird baths or leaking taps and irrigation systems. The birds may also have greater food resources available in or around townships, such as fallen grain after nearby fields are harvested, or spilled grain at silos. Even if copious food and water resources are no longer freely available in townships they may have been in the past. Being long lived, intelligent and habitual, the corellas may return to these areas simply because it is an ingrained flocking behaviour. The birds may also congregate in townships as they may be or have been shot at on rural properties in the past and know that this is less likely in townships.

Little Corellas will flock in their hundreds and thousands in these centralised areas across rural southern Australia. Banding studies in the Flinders Ranges (St John 1991) and in the Southern Flery (Temby 2010) have shown that each individual flock is not stable and is subject to frequent emigration and immigration as individuals and small groups move between larger flocks. Subsequently, each flock in rural South Australia must be treated as a dynamic group with individuals that can readily move between flocks across the landscape.

Across southern Australia, the summer flocks of Little Corellas exhibit predictable daily behavioural patterns.

The birds awaken just as the first light of dawn appears and they begin communicating loudly. The noise will intensify as the morning light increases and the birds begin to fly to nearby trees adjacent to their roosting tree. Not long after waking, the birds will fly in flocks to nearby feeding and drinking zones. The birds may feed for one or several hours during the morning. After feeding, the birds will usually congregate at diurnal roosting spots which often are in towns. Here the birds will be quite loud as they communicate with each other. During this diurnal rest period, birds may continue to call, especially young birds that beg for regurgitated food from their parents. Another feeding time normally follows in the mid to late afternoon, when the birds will depart the diurnal roost sites. In the late afternoon and prior to dusk, the birds will return to the night roost site and once again become very loud as they settle down in their positions. The birds can also be very noisy at their nightly roost site when the moon is full and can also be actively flying at night as lunar visibility is high. The flocks will also make a lot of noise if they are startled during the night.

Little Corellas are well known to chew and break off leaves, twigs and bark of the trees in which they reside, whether it be at their diurnal or night roost, or anywhere they happen to land.

While it is not entirely understood why this species is so destructive to its surroundings several theories exist.

Parrots have highly evolved beaks which are used in almost all aspects of their daily life. The beak is used for cracking hard outer casings of seeds, digging out insects from wood and soil, excavating nesting hollows and nesting cavity entrances, feeding, drinking, preening, courtship, caring for young and is important for mobility in tree canopies and foliage. The beak is made of keratin and is therefore continually growing, much like mammals claws. The birds must maintain and trim their beaks accordingly to keep themselves in peak physical fitness. Little Corellas therefore are likely to cause destruction of the implements that they use to maintain their beaks, which are often the trees that they are nesting in.



**(Right)** Corellas have strong bills and feet evolved to crack open hard objects

The birds may also browse their roosting tree extensively so they can have a 360° view from their roost site. By creating this view, the flock is once again increasing their chances of survival as they are more likely to see predators approaching.

It has also been noted that the Little Corella is a playful species and that they entertain themselves by chewing and browsing while they are perched. This playful behaviour is often

seen by young corellas playing with sticks and rolling on the ground and may be a part of social cohesion.

### 2.2.3 Impacts of browsing on trees

The high density of Little Corellas perching in the River Red Gums *Eucalyptus camaldulensis* within The Flinders Ranges Council area are having a detrimental effect on the overall health of the trees.

Undoubtedly, the River Red Gums come under a variety of other stressors that may contribute to poor health including water stress during drought, salinity issues and insect damage. Poor recruitment of juveniles in the creeks and rivers in the area can be attributed to the grazing impacts of introduced herbivores, such as rabbits, sheep and cattle.

Subsequently, a tree already compromised by water stress caused by a drought may have its health issues exacerbated by intensive corella browsing. In such instances the tree stress on the tree may prove fatal.



**(Left)** Little Corellas have diurnal and nightly roost sites where they can gather in their thousands. The birds communicate constantly and loudly at these roost sites.

When the Little Corellas break off the leaves or the stems of the outer branches of the gum tree, they are reducing the potential of the plant to photosynthesise, a cellular activity which

creates energy for the tree which allows growth and reproduction. Persistent and intensive pruning of the branches over time can result in the tree cutting back energy and nutrient flow to these branches, resulting in the death of the branch. The dead branch is then likely to fall from the tree in the future.

The prolonged browsing in the creeks nearby in Quorn has resulted in many dead trees, with the majority of trees in the Pinkerton and Stoney Creeks showing signs of severe browsing. Many of the large trees have no upper canopy left, with the dead upper branches being completely devoid of vegetation.

Many of the damaged trees are likely to regenerate once the severe browsing of the corellas subsides.

### **3.0 Summary of Previous Management Actions:**

The Flinders Ranges Council, along with several passionate community members of the community at Hawker and Quorn have actively been managing the Little Corella issue in both towns over the past decade.

#### **3.1 Actions undertaken by The Flinders Ranges Council**

The main aim of The Flinders Ranges Council has been to support members of the community in the management of the Little Corella.

The Council has limited funding available to allocate to active control of the Little Corella, however in the past staff have been involved in conservative and sporadic management techniques which have included; shooting of birds, use of Bird Frite cartridges, operation of gas guns, trapping and gassing of birds and scaring of birds from vehicles. These techniques have not been overly successful, undoubtedly due to the uncoordinated delivery of approaches.

The Flinders Ranges Council has been lobbying the State Government and the Local Government Association for several years to raise the profile of the Little Corella issue and generate interest in the development of a statewide strategy.

The Council has also kept in regular contact with representatives of the Department of Environment, Water and Natural Resources (DEWNR) and the Mid-North and York Natural Resource Management Board in regards to Little Corella management.

In 2012, The Flinders Ranges Council spearheaded the formation of The Flinders Ranges Council Little Corella Control Reference Committee. The function of the Committee is to guide

and support the Council and community members in best practice corella management. The Council has supported the Committee in coordinating regular meetings.

Several community information sessions and meetings have been held by Council and have resulted in the development of a Little Corella Community Information Booklet, information pamphlets and monitoring data sheets.

The Council has also coordinated a workshop for community volunteers on trapping and gassing Little Corellas in conjunction with DEWNR.

Council has also purchased several gas guns that are lent out to active community members.



**(Above)** Diurnal Little Corella roost at Colebrook Community, on the outskirts of Quorn.

### **3.2 Actions Undertaken at Quorn Caravan Park**

The current owners of the Quorn Caravan Park have been undertaking regular management of the Little Corella on and off their property since 2005. In 2012 the numbers of corellas roosting in the area was approximately 60,000 individuals. Their management actions have included a variety of methodologies including torchlight, clapping of sticks, gas guns and shooting of birds.

**Box 1** details a case study of the management undertaken by the owners of the Quorn Caravan Park between 2005-2015.

The owners are extremely vigilant and aim to scare away any Little Corella which lands within their management zone. They have found that an integrated management approach, which utilises a variety of techniques, is the most effective way to move Little Corellas out of their area. Currently, selective culling of birds in combination with gas gun and clapping sticks is utilised and this strategy has seen localised success, with no birds currently residing in and around the Park.

### **3.3 Actions Undertaken in Hawker**

Two rural properties outside of Hawker have been undertaking regular shooting to deter corellas from their properties for several years.

A passionate and active group of community members has been undertaking management of the Little Corella issue in the Hawker township in recent years with reasonable success in moving the birds on.

A gas gun loaned from The Flinders Ranges Council has been used in the township since 2013. It has been used on an ad hoc basis and was installed on the back of a ute and driven around the town, following the birds as they moved through town. This method used by itself has been unsuccessful, with the flocks simply moving to a nearby area within the town.

The greatest success experienced in Hawker was in 2014, when a small group of community members undertook a coordinated management approach after a flock of around 20,000 birds descended on the town. Over a ten day period this group of people spent approximately two to three hours a day driving around town with gas guns on the backs of utes and harassed the flocks. The team was stationed at a variety of positions throughout the town and maintained communication with each other over two way radios, providing information on the movement of birds in the area. These actions occurred at random times of the day to ensure the birds did not become habituated with a management pattern. On day eight of this period a shotgun was incorporated into the program and over the next couple of days approximately one hundred corellas were humanely euthenased. By the tenth day of management the birds had moved away from the township. Almost certainly the birds would have joined the closest Little Corella flocks which would most likely be in Quorn.

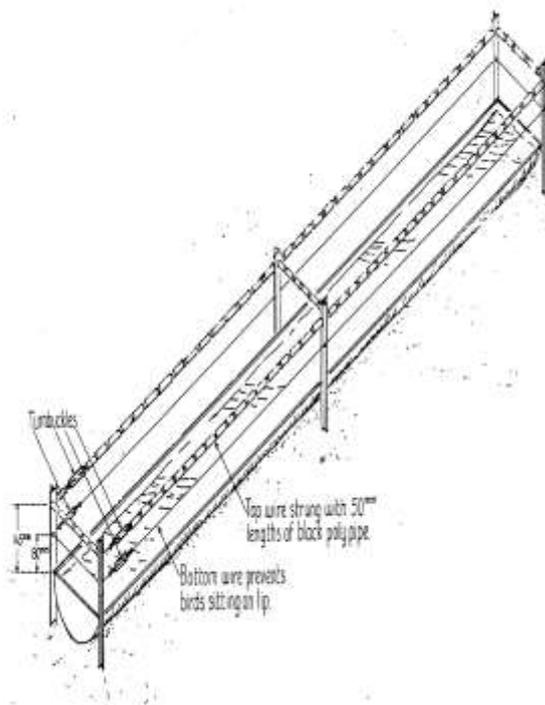
The success of the management undertaken in Hawker in 2014 displays how a community driven coordinated approach can achieve the desired results of moving the birds on from a priority management area. It also displays the importance of undertaking effective management across the whole region to ensure the problem does not simply move from one township to the next.

Visual deterrents have also been used in Hawker, with plastic snakes being placed on the synthetic lawn at the bowling club. This method had some success in deterring the birds.

### 3.4 Trough Modifications

Many stock water troughs in The Flinders Ranges Council district have been modified to restrict Little Corella access. The trough modifications involve running two lines of wire around the rim of the trough, with the top wire being covered in black polypipe (**Fig 1**). While the birds can still land on the upper wire, they cannot gain enough stability to drink properly and thus will move on to another water source. The wires are kept taut by turnbuckles which need to be regularly tightened.

While these trough modifications are effective when used, they must be used on all water troughs in the region in order to make some difference to the Little Corella issue.



**(Fig 1)** Trough modification design as described by St John (1991). These wires prevent the birds from drinking at the water source.

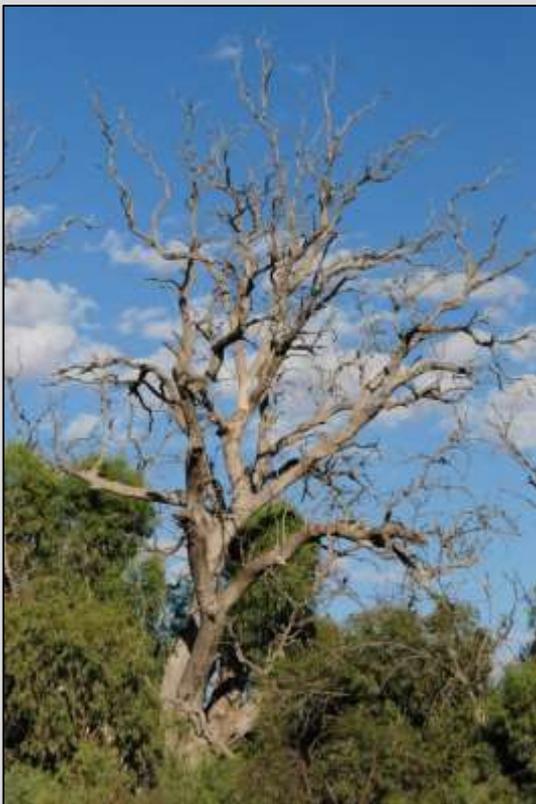
## Case Study : Quorn Caravan Park's Management Strategy 2004-2015

*"We treat every Corella as if it's a spark."*

When Gary and Bronwyn Lucas purchased the Quorn Caravan Park in 2004 they were well aware of the Little Corella issue in the town. They did not, however, realise how much of their time and energy in the following years would be spent managing the species.

The Quorn Caravan Park sits along the Pinkerton Creek which runs through the centre of Quorn. The large River Red Gums that grow along this riparian zone have been the central roosting zone for the large flocks of Little Corellas that descend on the township each year. Subsequently, these trees have been damaged by Corella browsing for many decades, resulting in several dead trees and many others having no upper canopy. Some of these trees regenerate somewhat over winter in the absence of the birds, however they are usually browsed back when the flocks return to town.

Gary and Bronwyn were primarily concerned about the impacts the Little Corellas were having on the health of the large trees, as they were central to the ecosystem of their Park. They were also concerned with the financial impact the birds were having on their business and the town as a whole.



When they arrived, the birds used to roost in these trees during the day and night while they flocked in Quorn during October and generally April (but as late as June if dry conditions persisted). At their peak in 2012, Gary and Bronwyn estimated over 60,000 birds were roosting in the trees.

Initially, Gary and Bronwyn attempted a variety of methods to scare the birds away from the area. They used a gas gun on the back of their ute and created loud noises by clapping wood together. Their first major success was moving the "super flock" away from the park at night, by shining strong torch light into the creek line trees at around dusk. During the day, these methods worked in disturbing the birds but they only moved 100-200 metres along the creek line. They began keeping very detailed notes of the numbers of Little Corellas and their behavioural patterns.

**Above:** While Eucalypts in the arid zone become water stressed in times of drought and can be affected by disease and insects, undoubtedly the main cause of stress and premature death of the trees in the Quorn Caravan Park is regular defoliation by Little Corella flocks.

It soon became clear that the Lucases needed to up the ante to manage the birds. Ongoing vigilance took up to about 30 hours a week.

By 2007, Gary and Bronwyn had increased the area they were managing and had moved out of their park boundary and into the wider Pinkerton Creek. This management resulted in the birds moving further away from their management areas but continued management actions 2-3 times a day were still needed to keep the bird numbers from increasing and encroaching back into their park.

In 2010, with permission from The Flinders Ranges Council and SA Police, Gary introduced a shotgun into his management actions and this was a “game changer”. As soon as the initial scout birds were observed in the creek line at the start of the season, Gary would shoot at a couple of birds (usually scouts). He would also aim to split up pairs by shooting one of them. The shotgun was used in conjunction with the gas gun and clapping sticks, as Gary and Bronwyn maintained their dedicated vigilance.

The following years saw conservative numbers of Little Corellas culled in a discreet fashion as part of the management strategy and each year, it was noted that fewer birds were arriving in the stretch of Pinkerton Creek that they were managing. By this stage, the birds recognised Gary’s hat and only needed to visualise this and they moved on. Gary had to retrain the birds when he replaced the old hat with a new one! Over the past years, the majority of damaged Red Gums are displaying signs of recovery as the defoliation decreases.



**Above:** Many trees in the vicinity of the Quorn Caravan Park are regenerating due to the absence of the corellas.

The birds now congregate to the West of the caravan park on private properties. The ongoing dedication of Gary and Bronwyn and their commitment to the ongoing monitoring of the birds and employment of a variety of management techniques has proved that the birds can be kept away from priority areas. Gary and Bronwyn are now comfortable to take holidays over summer for the first time in 10 years but still scare off any birds they observe in their area, as they know that ‘one spark can turn into a bushfire’.

### **Timeline of Management Actions utilised by Gary and Bronwyn Lucas:**

**2004/2005** – 60,000 birds approx. Massive flocks roosting in trees during day and night. Severe damage to trees. Management actions included stationary gas gun and torches, at dusk.

**2005/2006** - Still large numbers of birds, above actions repeated (minus torch at night)

**2006/2007** – Large numbers still arriving, above actions repeated but management area extended to involve wider Pinkerton Creek (1 km stretch). Some birds dispersing.

**2007/2008** - Above actions continued – large numbers still arriving but some dispersal from area. Extreme vigilance employed and success with moving flock on by getting underneath them in the creek line and driving them on.

**2010/2011** – Selective shooting and scaring by shotgun added to previous management actions. 40-50 birds destroyed, large numbers of birds displaced from park.

**2011/2012** - Shotgun, gas gun, sticks, large numbers still arriving but not settling in trees. 40-50 birds culled.

**2012/2013** –60,000+ birds arrived. This was the peak of Little Corella numbers. Shotgun, gas gun, clapping sticks all utilised. 200 birds culled. Most birds settling outside of management area.

**2013/2014** - Fewer birds settling in management zone with large numbers still arriving nearby. Shotgun, gas gun, clapping sticks utilised. 360 birds culled.

**2014/2015** – Very few birds have arrived in Quorn with none settling in management zone. Previous actions repeated. 40 birds culled.

## **4.0 Community Involvement and Education**

The success of this action strategy depends largely on the engagement and active involvement of members of The Flinders Ranges Council community.

There have been many meetings and workshops about the Little Corella issue in the region and while many people are passionate about the issue, only a small few ever become actively involved in management.

It is also likely that many community members may have become disengaged with the process and the semi-regular meetings that they have attended which seemingly do not achieve on ground outcomes.

### **4.1 Community Information Session**

A community information session is essential prior to the actions in this plan being implemented. This information session will be hosted by the Council and run by The Flinders Ranges Council Little Corella Control Reference Committee. The session will detail the success of management actions undertaken at the Quorn Caravan Park and will also detail the actions described in this plan.

At this community session it will be essential that two “Action Teams” are formed. Each action team will comprise at least five members of their representative township, either Quorn or Hawker. The members of each Action Team will agree to be actively involved in the management actions detailed in this plan.

Community Information Sessions will also need to be held at the end of the management season to evaluate the success of the Action Strategy and the management actions employed. This will be vital to ensure the very best results are achieved.

Prior to each management season, another community information session will be held to re-focus the community’s attention on the issue.

### **4.2 Involvement of Local Schools**

Several opportunities exist where the local schools of Quorn and Hawker can become actively involved in the management of Little Corellas.

When a Drone is used as a mechanism for bird scaring, regular and random use of the drone by school classes at Little Corella roost sites would be an effective way to engage the younger generation of the community in Little Corella management.

A central facet of management in this plan is monitoring of the Little Corellas and also monitoring the environmental impacts that they are having on the townships.

School classes can also be regularly involved in monitoring the movement of birds in the townships as well as on rural properties. Students could be involved in undertaking regular surveys for the species in the region and could also be responsible for collating this data into a central excel database. The school classes could create locality maps of where birds are roosting and once management actions commence, they could monitor where the birds disperse to.

Students can also be involved in the environmental monitoring outlined in this strategy. As management actions are applied, it will be important to collect data on the effectiveness of the strategies used. Photo points of Little Corella damaged areas (eg several gumtrees in Pinkerton Creek) will be used to monitor any recovery of trees over time as management actions are employed. The students could take a central role in this by taking the photographs and comparing them with previous photos and documenting any change observed.

#### 4.3 Development of Information Pamphlets

At the Community Information Session, information pamphlets outlining the main actions for the upcoming season should be handed out to community members.

The pamphlets will also be displayed around the townships on community noticeboards.



**(Above)** Massive flocks of Little Corellas descend on the townships of Quorn and Hawker each year.

## **5.0 Current Management Options:**

There are a multitude of options available to attempt to manage the impacts of Little Corellas. Some of these are lethal and others are non-lethal.

None of these options are a quick fix or a magic silver bullet. As Little Corellas are highly smart and will become habituated to certain deterrent mechanisms, it is imperative that a variety of management actions be used in conjunction with each other, with timing of delivery being randomised.

### **5.1 Trapping and Euthenasing**

Trapping and euthenasing Little Corellas is a difficult and time consuming task. Before trapping can take place, the birds must be habituated into a specific area where a trap will be set up. To encourage birds into the area they are usually lured in with a food source like grain. A trap or net is then set off once the birds are in the desired position. Once birds are in the trap, care must be taken to ensure they are all removed and then gassed with carbon dioxide.

Any person wishing to undertake trapping and gassing of birds, must undertake a half day training session with a Department of Environment, Water and Natural Resources (DEWNR) staff member to ensure they have the sufficient skills and knowledge to perform the task. Each trained person then must be accompanied by a DEWNR representative for the first two trapping and gassing sessions (DEWNR 2011). Trapping and gassing also requires a destruction permit to be issued from DEWNR.

Trapping and gassing also often only removes a very small proportion of the local corella population. For this reason and the difficult logistics involved, trapping and gassing is not endorsed as a recommended management technique.

### **5.2 Removing food and modifying watering points**

In many rural townships, Little Corellas and galahs readily feed at grain silos where some spilt grain may become available. It is imperative that any grain in the townships is completely covered in heavy tarpaulins and that any spilt grain is removed as soon as practical.

Being granivores, Little Corellas must drink regularly each day and thus are never far from available surface water. Modifications to stock water troughs can be easily made to prevent birds from being able to perch and drink from them. All water troughs in The Flinders Ranges Council district need to be fitted with the modifications if any real effect is to be noticed.

Any leaking taps or large irrigation leaks in town should also be repaired to prevent the birds from easy access to surface water. Town bird baths should also be removed over the summer period and modifications to garden ponds should also occur to prevent corella access.

The Little Corella flocks usually roost near their preferred drinking sites, so if there is no readily available water in the townships the birds are then likely to roost outside of town near a sewerage pond or rural dam. It is at these sites that further management actions should then occur to move the birds further away.

### 5.3 Alpha-chloralose poisoning and gassing

Alpha-chloralose is a drug that when ingested quickly affects the central nervous system of the birds, leading to a coma. Birds that have eaten the drug recover quickly however, as it is readily metabolised.

Alpha-chloralose has been suggested as a potential mechanism to be used to enable capture of Little Corellas in problem areas. Grain laced with the drug could be fed to corellas, thus enabling the birds to be easily captured by hand once under its effects. Subsequently, the birds could be humanely euthenased.

Initial field trials undertaken by DEWNR in the 1990's found that the usage of Alpha-chloralose baited in grain and water was effective in reducing the roost size in the study area in the short term. The birds however, became habituated with the baited grain and water and ceased feeding on it.

The Australian Pesticides and Veterinary Medicine Authority has rejected the usage of Alpha-chloralose in Australia and it is currently deemed as an ineffective control method by DEWNR. Therefore it is unlikely that Alpha-chloralose poisoning will become available for Little Corella management in the imminent future.

### 5.4 Shooting

Selective shooting of Little Corellas with rifles has proven to be a very effective method to disperse birds away from priority areas in The Flinders Ranges Council district.

The Little Corella is an unprotected species under the *National Parks and Conservation Act 1972* and therefore can be shot as part of a management program. Anyone undertaking shooting of the species must abide with the *Animal Welfare Act 1985* to ensure that suffering of the animals is minimised.

Any shooting to be undertaken within or nearby the townships of Hawker and Quorn must be approved by the local SAPol representative.

Broad scale culling of Little Corellas by shooting is likely to be an inefficient method of management due to the local emigration and immigration of birds between flocks.

It is recommended that shooting be used in conjunction with a variety of management techniques in order to relocate corella flocks. Scout birds arrive in Hawker and Quorn at the start of summer and are usually in pairs. It is recommended that one individual of the pair is

shot before the pair become established at the site. It is hoped that the surviving bird would depart the area and potentially prevent others establishing at the site. As more scout birds arrive, this procedure should be repeated.

Selective shooting of birds should continue throughout the season if corellas become established within the towns. For best effect, shooting should be performed at random and different times each day.

### **5.5 Bird Frite® Cartridges**

Bird Frite Cartridges are pyrotechnic cartridges that are used in a shotgun and are fired above a flock of Little Corellas where it explodes, emitting a very loud sound. Bird Frite is documented as being successful in deterring birds from a site if used in conjunction with other control measures. Use of this method requires SAPol approval and extreme care needs to be heeded as there is a potential for fire risk with the use of these pyrotechnics. Use of Bird Frite cartridges would be restricted to use outside of the fire danger season and thus only useful for a small part of the Little Corella management season.

### **5.6 Gas Gun scaring**

Gas operated guns are transportable units that can fire single, double or triple sounds that replicate the sound of a shot gun. Gas guns can be pre-programmed to fire at set intervals or they can be set off at the user's discretion. They have been found to be very effective in scaring birds from priority areas, especially when used in conjunction with actual shooting of birds.

Timing and randomness are once again central to the success of the gas gun and they should also be moved regularly to avoid habituation of the corellas to the gun. Best results have been achieved in Hawker and Quorn when the gas guns have been placed in the back of utes which have followed the birds to where they land while being fired at them. Actual shooting of birds with a shotgun reinforces the sound emitted by the gas gun.

The gas gun requires no permits from DEWNR.

### **5.7 Birds of Prey**

An effective method of dispersing Little Corellas from roost sites is by scaring them from the site with one of their natural predators – raptors. This can be achieved by either encouraging wild raptors to the site by dragging in carcasses or by employing an expert who can fly their trained birds of prey in the area.

Due to the limited available funds for Little Corella management, employing a raptor expert is not feasible for this project. Dragging dead animals into the townships of Quorn and Hawker is also not a realistic option and long term success using this method is unlikely.

### **5.8 Visual Deterrents (eg Bird of Prey kite)**

Visual deterrents such as flying kites that resemble birds of prey have also had short term success in deterring birds from localised sites. Kites would need to be regularly moved to avoid habituation and would logistically be difficult to install as many of the roost trees in Hawker and Quorn are very tall.

Bird of prey kites are relatively inexpensive and could be a useful addition to the management strategy to deter birds from a site as long as it was used in conjunction with other deterrence methods.

### **5.9 Audio scarers**

Audio or bio-acoustic scarers have been trailed with varying degrees of success in deterring Little Corellas in southern Australia. These audio scarers emit the hunting call of a bird of prey or the alarm call of parrots or honeyeaters, to alert the Little Corella flock of a predator in the area in the hope of the flock dispersing.

Like visual scarers, audio scarers must be randomised and cannot be ruled out as being an effective part of an integrated management strategy.

The sound created by clapping two large sticks together has also been used to great effect in the region and has deterred the birds from establishing roost sites.

### **5.10 Lasers/Torches**

Lasers and high powered torches have proven a very useful and cost efficient tool to deter Little Corella flocks from nightly roost sites.

Lasers and torches can be used as Little Corella flocks roost at dusk and after the birds have settled for the night after dark. Random and persistent laser and torch light can disrupt the flocks and force them to move to a new roost site.

### **5.11 Bird Scaring Drones**

Modern advances in technology have seen a multitude of uses for drones, which are unmanned aerial craft that can either be controlled by a person on the ground or they can traverse a pre-programmed course.

Drones have been used as bird scarers internationally, however are not widely used for this purpose in Australia currently. A drone that flies past or overhead a Little Corella roost site would likely have a similar effect as a bird of prey kite or even an actual bird of prey and may disrupt the flock to the point where they may disperse from the site.

Drones emit a loud sound that is also likely to unsettle the flocks and they can be retrofitted to emit bird scaring sounds and visual deterrents such as flashing lights and torches.

Under current legislation small drones can be used by local councils without a CASA permit. These small drones are limited in their battery life and can stay in the air for between fifteen and twenty minutes at a time.

A large benefit of including a drone in an integrated Little Corella management plan is as a form of community engagement. A drone is likely to be an easy way to include younger community members and school kids in active community participation.

### **5.12 Flashing lights on vehicles and high visual vests on people undertaking management**

Little Corellas are highly smart and observant birds and become easily habituated with regular patterns and visual cues. Therefore, all vehicles and people undertaking Little Corella management in The Flinders Ranges Council district will be identifiable with standard orange flashing lights being visible on all vehicles undertaking management and high visual orange vests being worn by any people undertaking management actions.

By doing this, it is hoped that the Little Corellas will negatively associate the flashing lights or the coloured vests on people with management techniques (such as shooting, bio acoustics, drones etc) and will disperse on visualising these items. Substantial time and money could be saved if all it took was the sight of these items to disperse flocks of corellas from the management areas.

## **6.0 Legislative Requirements**

The Little Corella is currently classified as an unprotected species under the *National Parks and Conservation Act 1972*. Therefore this species can be legally shot by landowners or employees without a destruction permit. A permit is required though if the birds are to be euthenased by way of trapping and gassing.

Any persons undertaking Little Corella euthanasia as part of ongoing management actions must ensure that they comply with the animal welfare standards outlined in the *Animal Welfare Act 1985* to ensure any suffering to individuals is minimised.

Any shooting actions undertaken within the townships or their outskirts in the Flinders Ranges must have permission from local representatives of the SAPol.

## 7.0 Local Government Association state-wide Little Corella project

The Local Government Association of South Australia (LGA) is currently undertaking a long term Little Corella management plan in conjunction with the Adelaide University. This plan will be focussed on addressing the requirements of councils across the state in regards to Little Corella management.

This is a long term project and due to the complexities involved in such a large project, it is unlikely to come into effect in the next two to three years.

The LGA recommends that any councils currently undertaking Little Corella management should follow their current management plans and focus on the issues in their region and await the state-wide plans recommendations that may compliment the current regional plans.

## 8.0 Management Recommendations

A monthly action strategy for managing the Little Corella in The Flinders Ranges Council district is displayed in **(Table 1)**.

The strategy is centred around the following aspects:

- **Monitoring of Little Corella numbers and movement.** This will be performed by active community members in the townships and on rural properties. Local schools could also become involved in this. Council will provide data sheets to the community and also be the central data storage facility.
- **Community Information Sessions.** These will occur to provide information to the community about the action strategy and to develop the “Action Teams” in Hawker and Quorn.
- **Modifying water troughs.** Before the commencement of the Little Corella management season, all water troughs (where practical) will be fitted with modifications to prevent corella access. All irrigation leaks must be repaired and any modifications to garden ponds and water tanks will be needed to be performed.
- **Shooting.** In July and August, any resident Little Corellas in the district will be euthenased to ensure they do not attract other birds to the area at a later date. Care must be taken to euthenase any young that may be in nest hollows.  
Shooting will also occur when the initial scout birds arrive in the townships at the commencement of the season. Pair bonds of Little Corellas will be broken when one of the pair is shot. Shooting will occur as necessary throughout the management season as new birds arrive in the townships.

- **Bird Frite.** Bird Frite will be used at the start of the season to deter any birds from establishing roost sites. It will not be used after the commencement of the fire danger season.
- **Banging of sticks.** Large sticks will be used to create noise that will frighten birds from their diurnal and nightly roost sites.
- **Gas Guns.** Gas guns will continue to be used and will be placed in the backs of utes where they will be fired at moving flocks of corellas.
- **Torches and Lasers.** Torches and Lasers will be used to deter any corellas from any roost sites that may be established in the townships.
- **Bird of Prey Kites.** These will be trialled if corellas set up permanent roost sites in the townships after other methods have been used.
- **Bird scaring drone.** A drone will be used to fly above any sites that may become established roost sites in the town. The drone will be an effective community engagement tool
- **Flashing lights and high visual vests.** Any community members undertaking any form of control will be required to wear a high visual vest provided by Council. Any vehicles utilised for management will also be supplied with an orange flashing light. These will be used to develop a negative association by the birds to these visual cues

## 9.0 Environmental Monitoring

In order to document the effectiveness of The Flinders Ranges Council Little Corella Action Strategy 2015-2019, it is necessary to undertake some basic environmental monitoring.

In both Quorn and Hawker, ten trees that have been historically impacted by Little Corella browsing will be selected for twice yearly photo point monitoring.

GPS coordinates of each tree will be taken and a digital photo of the whole tree including some foreground is to be taken at the start of October (beginning of the Little Corella management season) and again in May (end of the Little Corella management season). These images will be labelled with tree number and date and stored at a central database in The Flinders Ranges Council office.

This monitoring will be very useful to document any recovery of the trees if Little Corellas disperse from the area and will provide information about other issues potentially affecting the trees overall health.



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**Table 1) Monthly Action Strategy**

Month	Little Corella Behaviour	Action	Who	Escalated Management Options (to be used if proposed actions are not effective)
June	Some resident birds	Survey for resident birds	FRCLCCRC	
July	Some resident birds	Survey for any resident birds in the region and shoot all resident birds	FRCLCCRC	
August	No birds	Prepare community information session pamphlets. Inform community of information session date. Meet with SAPOL to discuss shooting options Undertake trough modifications and repair any water leaks Meet with school teachers and students to discuss school involvement	FRCLCCRC FRCLCCRC FRCLCCRC Council FRCLCC	
September	No birds	Community Information Session Form two "Action Teams" – one for Hawker and one for Quorn Commence bird surveys for any scout birds and commence shooting management if scout birds located	FRCLCCRC/Council FRCLCCRC/Council  FRCLCCRC/Action Teams/School groups	
October	Scout birds arriving	Undertake tree photo point monitoring	FRCLCCRC/School groups	



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		<p>Continue bird surveys and data collection</p> <p>Shoot one of every scout bird pairing</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>FRCLCCRC/School groups</p> <p>Action Teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>
November	Birds Present in area	<p>Continue bird surveys and data collection</p> <p>Continue selective shooting in conjunction with regular gas gun operation</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>FRCLCCRC/School groups</p> <p>Action Teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>
December	Birds present in district	<p>Continue bird surveys and data collection</p> <p>Continue selective shooting in conjunction with regular gas gun operation</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>FRCLCCRC/School groups</p> <p>Action teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>
January	Birds present in district	<p>Continue bird surveys and data collection</p>	<p>FRCLCCRC/School groups</p>	



Action Strategy for the Little Corella  
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		<p>Continue selective shooting in conjunction with regular gas gun operation</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>Action Teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>
February	Birds present in district	<p>Continue bird surveys and data collection</p> <p>Continue selective shooting in conjunction with regular gas gun operation</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>FRCLCCRC/School groups</p> <p>Action Teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>
March	Birds present in district	<p>Continue bird surveys and data collection</p> <p>Continue selective shooting in conjunction with regular gas gun operation</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>FRCLCCRC/School groups</p> <p>Action Teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>



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April	Birds present in district	<p>Continue bird surveys and data collection</p> <p>Continue selective shooting in conjunction with regular gas gun operation</p> <p>If birds set up roosts in townships, engage intensive 10 day management regime with randomised gas gun operation, bird frite, stick clapping, torches and lasers and bird of prey kites.</p>	<p>FRCLCCRC/School groups</p> <p>Action Teams</p> <p>Action Teams</p>	<p>Bird Scaring Drone</p> <p>Increase efforts, continue randomisation of all management techniques</p>
May	Birds dispersed	<p>Undertake tree photo point monitoring</p> <p>Evaluate effectiveness of Action Strategy and make amendments</p> <p>Community Information Session</p>	<p>FRCLCCRC/School groups</p> <p>FRCLCCRC/Action Teams/Consultant</p> <p>FLCLCCRC/Action Groups/Council</p>	

## 10.0 Monitoring and Evaluation of The Flinders Ranges Council Little Corella Action Strategy 2015-2019

Regular monitoring and evaluation of The Flinders Ranges Council Little Corella Action Strategy 2015-2019 will ensure that the plan is adaptive and can meet the changing needs of the community with this dynamic issue.

Evaluation of the plan will occur at the end of each Little Corella management season where The Flinders Ranges Council Little Corella Control Reference Committee and external consultant can discuss the effectiveness of the strategy. Any shortcomings in the strategy can be amended or new technological advances or methodologies can be written into it.

Community consultation of the amended strategy will also occur at community information evenings.

## 11.0 References

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*All photos taken by P Hodgens or supplied by The Flinders Ranges Council.*