

A Glider's Tale



Ellen Paterson, Courtney McKenna,
Ben Walther, Alana Cameron and Paris Rawaqa

James Fallon High School



Creative Catchment Kids

Creative Catchment Kids is an initiative of the Murray Darling Association and Wirraminna Environmental Education Centre. It aims to improve engagement between the Local Land Services and school students by providing opportunities for positive and authentic ventures that encourage students to develop creative solutions to agriculture and natural resource management issues.

Wirraminna Environmental Education Centre

The Wirraminna Environmental Education Centre is located in Burrumbuttock, north of Albury in southern NSW. Since 1995, the centre, which is adjacent to Burrumbuttock Public School, has provided opportunities for discovery and learning about the natural environment, the ecology of the local woodlands and the beauty of native plants. **www.wirraminna.org**

Murray Darling Association

The Murray Darling Association has membership of over 100 Local Government councils in the Murray-Darling Basin, as well as community groups, businesses and individuals with an interest in ensuring that the Basin continues as a valuable asset for all Australians. Since 1950, the Association has initiated various school and community education programs on managing the Basin's land and water resources. **www.mda.asn.au**



Enviro-Stories is an innovative literacy education program that inspires learning about natural resource and catchment management issues. Developed by PeekKdesigns, this program provides students with an opportunity to publish their own stories that have been written for other kids to support learning about their local area. **www.envirostories.com.au**

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Authors: Ellen Paterson, Courtney McKenna, Ben Walther,
Alana Cameron and Paris Rawaqa

Teacher: Brendon Finn

School: James Fallon High School

Local Land Heroes

In 2014, students involved in the **Creative Catchment Kids** program researched and wrote stories about 'Local Land Heroes' - people, businesses or industries who contribute to productive agriculture and healthy environments along the Murray and Murrumbidgee rivers. The program was generously funded by Murray Local Land Services and Riverina Local Land Services. Production of this booklet was supported by the Slopes to Summit (S2S) partnership of the Great Eastern Ranges Initiative through funding from the NSW Government's Environmental Trust.

Local Land Heroes acknowledges the United Nations 2014 International Year of Family Farming.
www.fao.org/family-farming-2014/en/



Local Land Heroes is part of Enviro-Stories, a PeekKdesigns education program.



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Squirrel gliders

Squirrel gliders (*Petaurus norfolcensis*) belong to the possum family, which has 26 species. They grow to around 20cm in length, plus a 27cm fluffy black tipped tail. They have a gliding membrane which runs between their forepaw and ankle. They can glide up to 70m, though distances of 30m are more typical.

Squirrel gliders are found in eastern Australia, and are listed as vulnerable on the NSW Threatened Species Conservation Act (TSC Act). Gliders live in woodland and open forests which are dominated by eucalypts and which usually have a shrubby understorey. The area occupied by a family group is defined by scent-marking, which stops neighbouring groups entering. Gliders nest and sleep in tree hollows with small entrances, though they will use man-made nest boxes. These mammals eat invertebrates, and also have a sweet tooth for honey, nectar, and honeydew. They live in a family with one or two males and females, and their offspring. Females bear one or two young, with most young born in winter. Young spend about 70 days in the female's pouch.



Photo Credit: Peter Merritt

Pressures on our Gliders

Squirrel gliders are a vulnerable species for several reasons; the loss of good quality habitat (causing a decrease in safe hiding spots and less available food), the breaking up of habitat into small patches (making it difficult for gliders to get around), introduced predators, and barbed wire fences.

Squirrel glider habitat has been, and still is being, cleared to make way for roads, new estates, and agriculture. The large trees removed in this process are essential for the survival of gliders as they provide both food and shelter. Without these necessities gliders are put in vulnerable positions where they have no dens, no food, and are left exposed to predators.

Barbed wire fencing is another contributor to the decrease in population of Squirrel gliders. As trees become further apart individuals must glide closer to the ground, which increases their chances of colliding with a fence. Gliders that end up on the ground are easy prey for introduced predators.

Prior to European settlement Squirrel gliders had fewer predators – mainly owls and goannas. After settlement, additional predators were introduced such as foxes, dogs and cats, which hunt during the night when gliders are active. Communities like Burrumbuttock must work together to protect gliders and other native species.

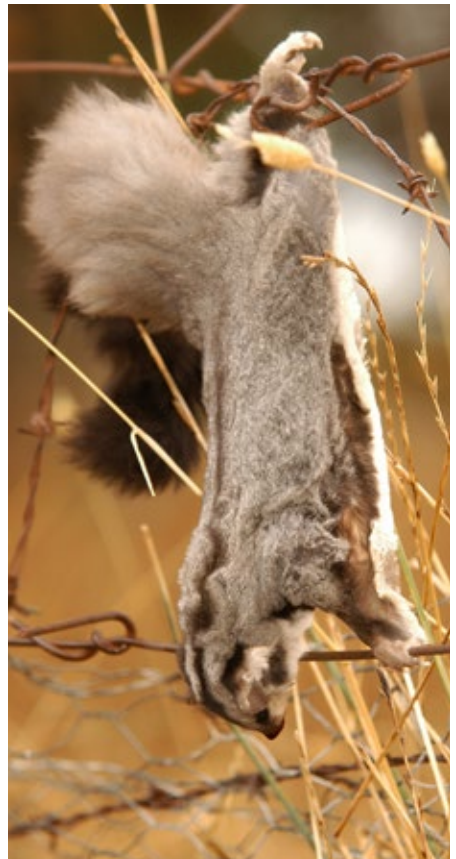


Photo Credit: Peter Merritt

A Local Area Management Plan

LAMP stands for Local Area Management Plan. The Burrumbuttock LAMP concept was developed by Dr. Matt Cameron and it aims to develop a plan which when implemented will ensure the long term survival of Squirrel gliders in the area. This is achieved by making sure there is sufficient habitat in good condition to support a viable population of the threatened species. To be viable, a population needs to contain 500 breeding individuals.

The Office of Environment and Heritage (OEH) is working with the community of Burrumbuttock to develop a LAMP for their Squirrel gliders. An important first part of preparing the LAMP is obtaining information on the number and distribution of gliders in the local area, and mapping the extent and condition of their habitat. Using this information, we are able to identify what work needs to be undertaken to improve the quality and extent of glider habitat.



The community of Burrumbuttock was chosen for a LAMP as it contains the threatened and iconic Squirrel glider, significant habitat change had occurred in the area (placing the local Squirrel gliders at risk of extinction), there was a long history of the community undertaking works to benefit Squirrel gliders, and the community had identified Burrumbuttock as a priority site for Squirrel glider conservation.

Examining the Burrumbuttock Community

Burrumbuttock is situated on the South West Slopes, in the state of New South Wales. It is only 35km from the nearest town Albury. Burrumbuttock is a small town, approximately four hectares with a population of only 150 people - enabling it to be a close community. Most people own farms, have farm-based jobs and live in the scenic surroundings of native bushland.

The local area has mostly been cleared for agriculture yet there is a well maintained and revegetated tourist attraction called the Wirraminna Environmental Education Centre. This centre works to educate the community and school students how and why to preserve and beautify the natural environment.

The Burrumbuttock Squirrel glider population has been identified as a key biodiversity asset in the NSW Murray Biodiversity Management Plan. The Burrumbuttock community has been instrumental in the revegetation of Squirrel glider habitat over the past 20 years and the LAMP aims to continue and expand on this work.

Wirraminna, in partnership with West Hume Landcare, has been hugely involved in creating interest in Squirrel gliders, by inviting schools, community citizens and people who have never even heard of Squirrel gliders before to come out and engage in the LAMP.



People and Organisations Involved

It is essential that Burrumbuttock landholders are motivated and interested in being involved in the LAMP because they are a major part of the project, positive results come from cooperative partnerships. Other organisations which are working in collaboration with the town are Murray Local Land Services, Wirraminna Environmental Education Centre and the West Hume Landcare Group. Importantly, Burrumbuttock was chosen for a LAMP due to the cohesiveness of the town and its interest in protecting Squirrel gliders.



To aid in the survival of Squirrel gliders, landholders can replant native vegetation, eliminate barbed wire fences, build more nest boxes and try to minimise introduced predators on their properties.

People who own land might be hesitant to participate in the project as their crop space is being taken, they're too busy and/or they don't want to pay for the expenses that come with protecting gliders.

Through community partnerships in Burrumbuttock, farmers have the opportunity to learn about the importance of gliders and how they can implement the LAMP within their time constraints and budgets. This will ensure that looking after glider habitat can easily become a good habit which will continue long into the future.

Big and Old Trees

The Squirrel glider lives along the coast and inland slopes of Queensland and New South Wales, extending into central Victoria. They are usually found in dry forests and woodlands, with remnant native vegetation along waterways and roadsides providing important habitat. Mature aged trees provide critical habitat, as these have the hollows that provide shelter from the natural elements and protection from predators.

Although we may see large old trees to be dead, Squirrel gliders use them as homes, or dens, which become nesting sites and a place to take refuge. The older the tree the better it is for habitat as they have more hollows that gliders can use. Family groups of gliders have been recorded to use hollows in up to 19 different trees within a season. They are very social animals and a single hollow can be filled with up to 10 gliders, all at the same time. The denning of gliders is thought to be an energy saving activity, particularly in the cold winter season.

In a single night Squirrel gliders may move up to 1.6km and it is estimated that social groups have a home range of up to 9 hectares, depending on the quality of the habitat. In areas with poor habitat gliders need to venture further to find food.

In Burrumbuttock the Squirrel glider habitat is often quite degraded and may not provide enough resources for the species long term survival. As a result of land clearing for agriculture there are now a greater number of habitat patches, but these are small in size and often too far apart for gliders to move between them. This limits the likelihood of gliders surviving in these patches.



Photo Credit: Owen Dunlop

Essential Plant Communities for Survival

Around Burrumbuttock there are two main types of bush that Squirrel gliders live in – these bush types are called plant communities. The two main plant communities are Blakelys Red Gum – Yellow Box Grassy Woodland (shown in red on the top map opposite) and White Box Grassy Woodland (shown in yellow on the top map opposite). Both of these plant communities contain large tall trees (bottom map opposite), mid story plants consisting of wattles and other native species, and ground covers of native grasses.

These plant communities are mainly cleared and highly threatened which is one reason for the decreasing population of Squirrel gliders. Clearing for cropping removes all the native vegetation. Clearing for grazing removes the tall trees and mid story plants, while subsequent fertilisation of the soil allows exotic weeds to flourish and out-compete the native grasses.

A few types of trees which are commonly used by Squirrel gliders are Yellow Box, Blakely's Red Gum and White Box, however, they can also be found in Grey Box, Mugga Ironbark and River Red Gum.



Photo Credit: Office of Environment and Heritage



Map Credits: Murray Local Land Services & Office of Environment and Heritage

Food and diet

Squirrel gliders are omnivores which means they eat both plants and animals.

A Squirrel gliders diet changes with the different seasons as some plants flower or produce sap at different times of the year. Gliders largely eat wattle gum, eucalypt sap, pollen, nectar, honeydew and manna (a white, sweet substance oozed from plants which have been attacked by insects).

Squirrel gliders eat small invertebrates (animals without a backbone) which mostly consist of beetles and caterpillars. They discard the hard exoskeleton (animals shell) as it doesn't contain much nutritional value. Of all the species of gliders the Squirrel glider eats the most invertebrates in its diet.

The glider spends nearly half of its time searching for and feeding on pollen and nectar, a third of its time hunting invertebrates, and the remaining time on honeydew and other plant based food sources.

When the mid story of a Squirrel gliders habitat is removed so too is a significant portion of its pollen and nectar sources. When large trees are removed there is less chance of a glider finding soft, rotting bark which often houses invertebrates to eat. Large trees are also an important source of pollen, nectar and other sugary foods. Therefore, revegetating native bushland is crucial to replace food sources and provide shelter for gliders.



Photo Credit: Owen Dunlop

Building a food chain!

Plants are one of the main contributors to an ecosystem. They are called **producers** as they take sunlight and produce sugar for themselves and other animals to eat.

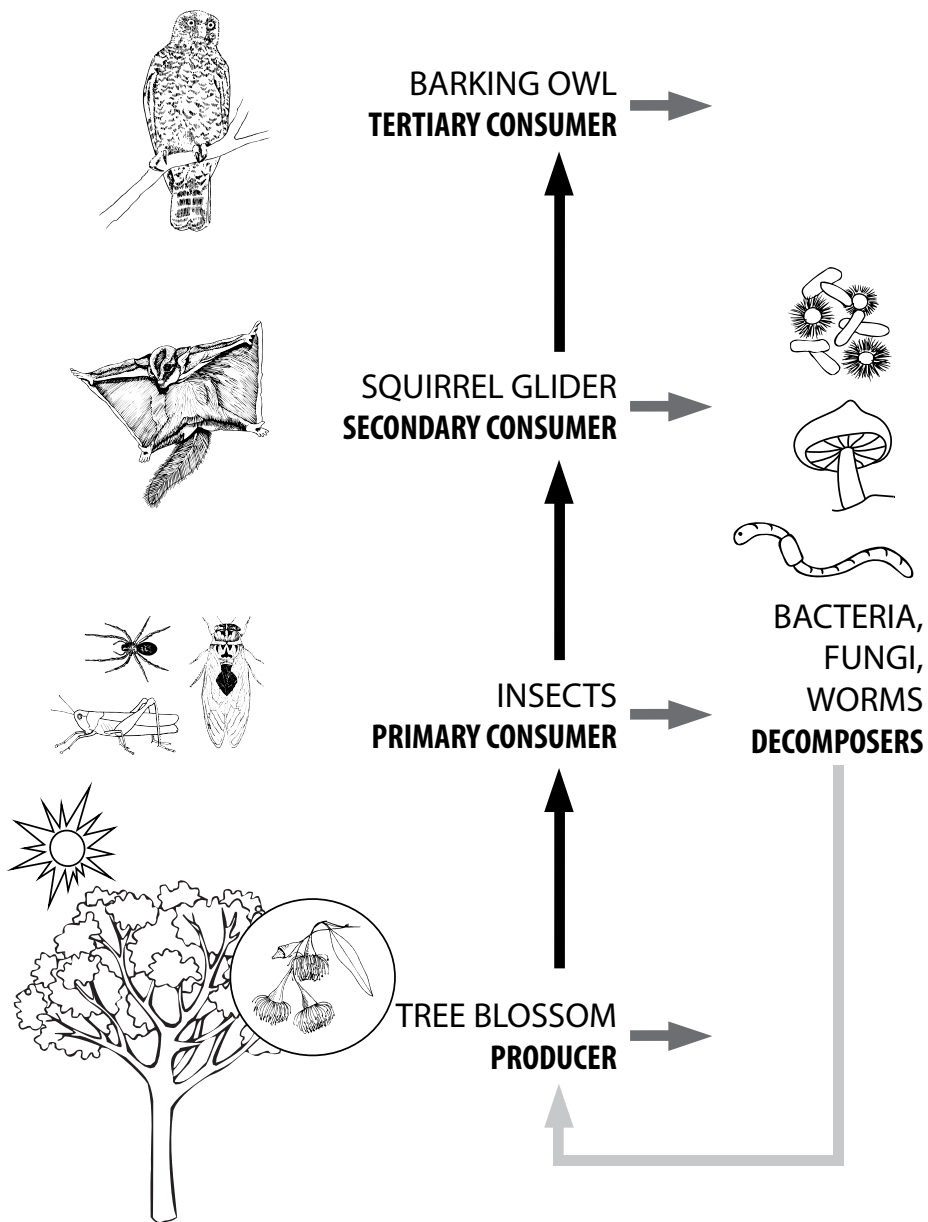
This sugar is stored in fruit, bark, leaves and roots of trees, and is eaten by small animals called **primary consumers**. These are mainly bugs and insects.

Larger animals, such as the Squirrel glider, are attracted to trees as they contain both sugary foods and small invertebrates to eat. These larger animals are called **secondary consumers**.

Finally, larger predators are attracted to the trees that now contain a variety of food sources, including larger prey animals. Animals such as owls, foxes and dogs fit here - they are called **tertiary consumers**.

Additionally, trees provide shelter for animals to live in. In the case of invertebrates this could be under bark or in leaves. Larger animals require hollows, which are created when branches break off the tree and leave a hole. Squirrel gliders use these holes for shelter and protection from predators.

When plants and animals die, their nutrients are returned back to the ecosystem by **decomposers**. Decomposers include bacteria, insects and mould and fungi.



Counting our stock!

Scientists have a good understanding of Squirrel glider behaviour and the threats to their ongoing survival. They also know what habitats they prefer, what foods they eat, and their place in the food chain.

How do scientists turn this into a LAMP?

Firstly, scientists must know how many Squirrel gliders there are and the quality of their habitat in and around Burrumbuttock. This work is currently being undertaken by researchers from the University of Melbourne. They set non-harmful traps baited with honey, oats and peanut butter to catch gliders. The traps are located about 3m high in the trees and are covered with shade cloth to help protect gliders from predators. Scientists check all traps early in the morning so that gliders don't get too stressed.

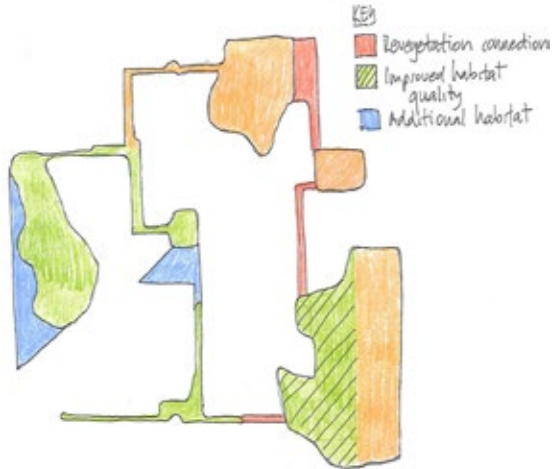
Researchers record data from trapped Squirrel gliders, including their gender, age, weight, body condition, if the female has had any joeys, and if it has a microchip. Researchers place traps throughout different habitats to find out which habitats contain gliders, the density of gliders per hectare, and to estimate their overall population. Up to mid-2014, over 30 sites had been surveyed for gliders on private land, roadsides and stock reserves. Monitoring will continue throughout the LAMP program to check the health of the population of gliders and the condition of their native habitat.



Connecting habitat patches

After the first round of surveys have been conducted, scientists will have information on the likely number of Squirrel gliders within the Burrumbuttock community, the quality of their habitat, and the location of these habitat patches.

This information will be used to create maps of glider habitat. Mapping this information will show us areas where there is not enough habitat to support gliders, and areas where there are gaps in the habitat that prevent gliders moving around. If patches of habitat are more than 50m apart gliders won't be able to make it in one flight, which exposes them to predators on the ground.



These areas can then be the target of planting native species or erecting nest boxes, which will increase the amount of habitat or connect the habitat patches. Once the planted trees have established they will provide a food source for gliders and dens for protection from predators, as well as allowing animals to move between patches.

Information evenings have been held to inform people about the population and habitat surveys. Once all the information has been gathered, the community can be involved in a series of workshops to help them integrate it onto their properties. Landholders will decide the best places to plant trees or erect nest boxes. These target areas will be included in the finished LAMP program which will then be voluntarily agreed to by community members.

Friends of the environment

Destruction of Squirrel glider habitat is one of the main reasons why their population numbers are declining. Therefore, the most important action we can take is to stop destroying this habitat, replant in areas which have been affected, and take action to protect Squirrel gliders from predators. It is especially important to protect large old trees, which provide hollows for dens, flower more vigorously (more food), and have peeling bark where invertebrates can be found.

A good way that you can help gliders is by volunteering with your local Landcare group. This work could include undertaking revegetation, putting up nesting boxes, fixing older fences and removing existing barbed wire. Barbed wire can be covered with poly pipe using an applicator which you can borrow free from the Murray Local Land Services.

Another simple step that can be taken is to keep an eye on your domestic animals and bring them inside at night. This will stop them hunting Squirrel gliders during the gliders prime feeding time.

This website contains a list of local organisations around the Riverina Region who you can be involved with: www.ecoportal.net.au



For more specific information on Squirrel gliders you can Google and download the “Squirrel glider habitat management guide”.

We would like to thank the following people for their help with our book:

- Mr. Brendon Finn
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- Dr. Matt Cameron (Office of Environment and Heritage)



Ellen Paterson, Ben Walther, Courtney McKenna,
Alana Cameron and Paris Rawaqa
2014 Year 9 and 11, James Fallon High School

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Services
Murray



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