



Nature's workforce

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Cotton onto critters - Getting to know your natural workforce

Birds, bats, spiders, wasps and other predatory insects contribute to pest control in the crop – this is your natural workforce. To reap the benefit of your natural workforce, simply look after the bushland on your farm.



Green tree frog sitting on a siphon on a St George cotton farm, Photo: Craig Saunders

In Summary

The Science

There is an amazing diversity of birdlife on cotton farms and nearly one third of all Australian bird species are found in cotton growing regions. Native insectivorous bats (microbats) are attracted to irrigated cotton crops in inland Australia by the abundant invertebrate populations.

Helpful Hints

- Keep standing dead trees and logs to conserve hollow and shelter habitats. Build bird and bat boxes to put up in younger trees or on posts.
- Implement a feral animal control program. Feral pigs, cats and foxes are

predators of ground nesting birds, small mammals, reptiles and frogs.

- Look after your bushland – it's the home of your natural workforce. Plant trees and encourage regeneration of trees, shrubs, and grasses to link isolated remnants.

Benefits to the Farmer

Native animals in healthy native vegetation help keep the right balance of pests and predators.

Am I making a difference?

At night, shine your machinery headlights, a spotlight or torch around your bush and in your trees. Record what you see.



Cotton Catchment Communities CRC

KEY CONCEPT: Biodiversity

Biodiversity, or “biological diversity” is the variety of life forms: all plants, animals and micro-organisms, the genes they contain, the ecosystems they form and the “bioregions” they live in. Bioregions are landscapes with similar geology, climate, plants and animals. Cotton is grown predominantly in the Darling Riverine Plains and the Brigalow Belt Bioregions, characterised by fertile floodplains, big rivers lined with magnificent gum communities and diverse woodlands on lighter soils. Bioersivity provides ‘ecosystem services’ – the benefits we gain from our environment. The management of biodiversity in agricultural lands is critical in ensuring that agriculture remains environmentally and economically

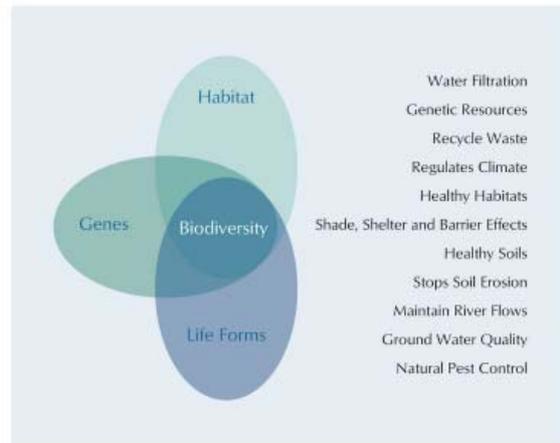
What does the science say?

Nearly one third of all Australian bird species are found in cotton grown regions. There is an amazing diversity of birdlife on cotton farms and 138 species of birds have been recently recorded on Namoi cotton farms, including woodland bird species such as the Rufous Whistler, Grey-crowned Babbler, Chestnut-rumped Thornbill, and the Brown Treecreeper which are in declining numbers.

Waterbirds are abundant and diverse in cotton growing regions. A bird study of 19 water storages on 9 cotton farms in the Gwydir Valley, recorded 42, 495 birds and 45 different species, including waterbird species of conservation significance – the magpie goose, blue-billed duck, freckled duck and the Australasian bittern.



Purple swamphens forage in wetland vegetation and nearby paddocks in cotton growing regions. Photo Jan Prewett



Biodiversity and the ecosystem services

Large numbers of invertebrates are found in and around cotton crops. In one cotton crop 450 species of invertebrates were recorded and another study reported 90 species of generalist predators such as ladybeetles and red and blue beetles. Ground densities of ants in unsprayed furrow irrigated cotton reached 812,222 ants /hectare in mid-summer 1998-99.

Native insectivorous bats (microbats) are attracted to irrigated cotton by the abundant invertebrate populations. A study in the Lower Namoi recorded seven species of microbats over cotton next to remnant vegetation and only three species of microbats over cotton isolated from remnant vegetation.

While native mammals are rarely found in cotton fields, grassland and woodland patches can provide habitat for Sugar and Squirrel Gliders who live in trees as well as mammals like the Narrow-nosed Planigale, and the Stripe-faced, Common and Fat-tailed Dunnarts which are ground dwellers small enough to live in soil cracks.

What can you do about it?

To look after and encourage our native fauna into cotton growing areas we need to actively manage our native vegetation and natural habitats to ensure these animals can complete their lifecycle and there is a place for their young to live:

- Keep standing dead trees and hollow logs.
- Build boxes to put up in younger trees or on posts.
- Minimise chemical use near natural grasslands and woodlands.
- Control stock, fire and vehicle access in your bushland to maintain a diverse ground layer in including logs, fallen branches, leaf litter, natural cracks in the soil and native grasses and herbs.
- Control weeds and feral animals on your property. Ask your local CMA or NRM body for advice.
- Plant trees and encourage regeneration of trees, shrubs, and grasses near existing vegetation on your farm to increase wildlife.
- Increase the size of the vegetation remnants and to reduce the distance between vegetation remnants.
- Talk to your local CMA or NRM body about the habitats on your farm and in the locality and how you can encourage native animals onto your farm.

Am I making a difference?

- At night, walk or drive 100 m shining your machinery headlights, a spotlight or even a torch around your bush and in your trees. Record the location, date and time you spotlighted and any creatures that you saw.
- Use field guides to identify the birds, insects, spiders, ants, frogs and reptiles on your property
- Keep an eye out for the following 12 bird species identified as indicator species of healthy habitats in the "Birds on Cotton farms" book.

KEY CONCEPT: The natural workforce

A good farm manager encourages, supports and recognises the skills of the many people employed by the business such as bug-checkers, contractors, irrigation consultants, researchers and extension officers. Yet on farms there is another workforce which is not always recognised - it is the natural workforce. This natural workforce is as a direct result of the biodiversity that exists on your farm, within your catchment and beyond.

Birds, bats, spiders and predatory bugs and beetles are like farm workers who work hard to keep the farm working on a day-to-day basis. Migratory birds and other species which are intermittently present represent contractors, consultants and other people who provide on-farm services as required – perhaps on a seasonal basis. Certain specialist species such as soil aerators and carbon accumulators are similar to researchers who have an in-depth understanding in a certain area. Threatened species, such as small ground dwelling mammals and ground nesting birds, can be likened to the labour and skills that are in short supply. On-farm native vegetation, which provides food and shelter for native species to be able to survive and thrive, is like the infrastructure required to grow and harvest a cotton crop.

This natural workforce provides many important services like clean waterways, productive soils and resilient production areas which are able to withstand periods of drought, flooding and fire. We rely on these services to survive and enjoy life and they play a crucial role in cotton production systems.



There are many wildlife nest box designs, simply screw a tin lid and timber base on a natural hollow and cut a hole according to the size of the animal to be attracted. Using quality waterproof material is essential to making the boxes last. Commercially built wildlife boxes are available.

Photo: Phil Spark

Benefits to the cotton grower

- Natural pest control – generalist insect predators, parasitoids, pathogenic fungi, birds and bats can assist cotton growers to reduce their reliance on pesticides. In healthy habitats birds can eat as much as half of all the invertebrates present, microbats can consume up to 75% of their own body weight in insects every night, all of which assists in preventing the outbreak of secondary pests in and around crops.
- Soil health – The local above and below ground fauna works hard at pollinating, recycling nutrients, improving soil structure and dispersing seeds.

Benefits for biodiversity

- Species health – In the last 10 years the introduction of transgenic cotton and IPM has resulted in a 60% reduction in pesticide use which has had a positive effect on biodiversity in and around cotton.
- Habitat protection – Protect the habitats in which birds, bats, bugs and other bushytailed creatures thrive and therefore preserving essential food chains.



Cotton grower James Thomas has built bat boxes to encourage insectivorous bats onto his farm and integrate them into his pest management strategies at "Bloomfield"
Photo: Guy Roth

For more information:

Web pages

<http://www.birdsaustralia.com.au>

<http://www.threatenedspecies>

www.cottoncrc.org.au

environment.nsw.gov.au/tsprofile/home_species.aspx

http://users.bigpond.net.au/ozbox/br_pos.htm

Scientific Publications

Cotton CRC project (In progress).
Identifying habitat requirements for birds on cotton farms in the lower Namoi. Birds Australia.

Franks, A. Nest Boxes for Wildlife.

Lindenmayer, D., Crane, M. & Michael D (2005) Woodlands: A disappearing landscape. CSIRO Publishing.

Reid, N., O'Shea, G. & Silberbauer, L. (2003) A review of biodiversity research in the Australian cotton industry, Final report to the Cotton Research and Development Cooperation, December 2003, Project No. 6.2.26.

Identification Guides

Ford, G. & Thompson, N. (2006) Birds on Cotton Farms. Cotton Catchment Communities CRC.



Australian Government

Department of Agriculture, Fisheries and Forestry
National Landcare Programme