



FINAL REPORT

(due within 3 months on completion of project)

Part 1 - Summary Details

Cotton CRC Project Number: 5.01.06.03

Project Title: Fishes on Cotton Farms field guide

Project Commencement Date: 01/01/2009 **Project Completion Date:** 30/06/2009

Cotton CRC Program: The Catchment

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Part 3 – Final Report Guide (due within 3 months on completion of project)

Background

Cotton production has grown to become one of Australia's most important agricultural industries, with several regional economies supported by its development, including those in the north-west NSW region. Growing cotton is an intensive land use, requiring cultivation of the soil, inputs in the form of fertiliser and pesticides, and a reliable supply of water. The location and extent of cotton-producing regions means that they have the potential to significantly affect water quality and river flow, affecting downstream landholders and communities, as well as health of riverine and wetland systems. The cotton industry has in recent years worked closely with natural resource managers to implement improved practices that have had beneficial effects on the health of rivers and waterways. It is now widely accepted that protecting and improving the condition of riparian lands and waterways is an important part of the management of cotton farms.

Much of the serious decline in native fish populations in farming regions is due to habitat loss and degradation. This has occurred primarily through the regulation of waterways for water extraction and impoundment; the clearing and degradation of native riparian vegetation; the removal of large woody debris to increase water efficiency, and; the pollution of waterways from increased sediments and nutrients.

To highlight the importance of maintaining and enhancing riparian and aquatic biodiversity on cotton farms, it is proposed that a field guide entitled *Fishes on Cotton Farms* be produced for the north-west NSW region. This production complements a guide entitled *Birds on Cotton Farms*, which provides cotton growers with a better understanding of bird species and their habitat requirements in the farming landscape. The guide also complements the management guidelines outlined in the Australian Cotton Best Management Practice (BMP) manual.

The guide outlines some simple management practices that cotton growers can employ to maintain and improve local native fish populations, as well as provides photographs and descriptions of appearance, behaviour, habitat and preferred diet for local native and introduced fish species. Information was adapted from existing publications, including *Fishes of the Murray Darling Basin* and *What Fish is this?* with a specific focus on the north-west NSW catchments.

The book, *Fishes on Cotton Farms*, will help inform, encourage and motivate cotton growers to conserve the native fish that are dependent on the health of waterways that run through their farms, and in doing so make their farm a more productive, sustainable and healthier enterprise. The book will also serve as a useful guide to engage local fishing clubs and anglers, informing them of the fish species that are expected to occur in the local area and methods that they can also employ to help conserve local native fish populations.

The *Fishes on Cotton Farms* book will be a relevant publication for a range of government agencies and industry bodies, helping them meet an array of management target and objectives. More specifically this includes the Namoi CMAs management target for people and their communities that aims to improve people's recognition of, and attitude to, NRM issues and appropriate management practices; the Cotton Catchment Communities CRC strategic plan catchment goal of developing a set of catchment information resources that are consistent with good science, best practice, practical adoption and catchment goals, and; the MDBA Native Fish Strategy objective of ensuring community and partner ownership and support for native fish management.

Objectives

The *Fishes on Cotton Farms* book aimed to engage with local cotton farmers, landholders and anglers in the north-west NSW region to identify management activities that they can undertake to assist in protecting and rehabilitating fish habitat and conserving local native fish populations.

The main objectives of the project were:

1. To increase the knowledge of local landholders and anglers about native fish populations and the threats that affect them
2. To increase the awareness of local landholders about how the management of their enterprises relates to fish habitat management
3. To work collaboratively with local landholders and key stakeholder groups to promote aquatic habitat awareness and engage the local community
4. To foster better communication between landholders, government agencies and local communities

Methods

The production of the field guide to fishes on cotton farms in the NSW north-west region involved a range of processes and stakeholders to ensure the successful adoption of the guide.

This included holding initial inception meetings with representatives from the cotton industry, angling community and government bodies to determine an appropriate format and information needed to engage with the target stakeholders. The workshop help gauge the level of knowledge about local fish species, the potential impacts that affect these species and management techniques that can alleviate the pressure placed on native fish. This information assisted in directing the content of the field guide.

Following on from this, an extensive search of relevant existing information was conducted. This included information on local fish species, habitat requirements, cotton farm practices that can affect riparian and aquatic habitat, and management actions currently employed. This process assisted in determining potential

information sources, as well as identifying knowledge gaps that needed to be further investigated.

The information collected from both the meetings and literature search was used to develop the field guide book in conjunction with a graphic designer and relevant stakeholders to ensure that the publication is user friendly, whilst also displaying the relevant information on cotton farms, local fish and management actions. Following the completion of the guide, an official launch was held amongst the local community, including cotton growers, anglers and agency representatives to raise awareness about suitable land management and potential affects on native fish.

Results

The knowledge of local landholders and anglers about native fish populations in north-west NSW has been increased through the production and distribution of the *Fishes on Cotton Farms* guidebook. The book outlines detailed information about 15 native fish species and four alien fish species found in the region, providing images and information that will help landholders and anglers identify species and their habitat and food requirements. The guide also contains information about threats that affect the distribution and abundance of native fish species. These habitat threats are related to land management practices through the presentation of key management principles. Principles such as 'Fish need trees', 'Keep irrigation fish free', 'Protect your fish nurseries' and 'Keep it messy' are explored in detail to inform landholders and the general community about simple actions that can be undertaken to help improve fish habitat.

The distribution of the *Fishes on Cotton Farms* guide to landholders and the general community in north-west NSW will help raise awareness about aquatic habitat and native fish issues. In addition to this, the involvement of representatives from the cotton industry, the local angling community and the local community throughout the production of the guide and its launch has helped to promote aquatic habitat issues and land management practices with key stakeholder groups. This involvement has also helped foster better communication between landholders, government agencies and local communities, which will assist in the distribution and uptake of the guide.

Outcomes

The production and distribution of the *Fishes on Cotton Farms* guide has helped achieve the planned outcomes of the project. These were to increase landholder awareness of native fish habitat requirements and the management actions that can be used to improve aquatic and riparian habitat, leading to an increase involvement of landholders in targeted on-ground works that aim to rehabilitate riparian and aquatic habitat.

Involving representatives from key stakeholder groups during the development and distribution of the guide helped to produce a user-friendly publication that is accessible for landholders, anglers and the general community. The information

presented in the guide will raise the awareness of native fish and their habitat requirements amongst these stakeholders. Following on from this, it is envisioned that there will be an increased understanding of potential management actions that can help improve these aspects, with an increased involvement in on-ground projects in north-west NSW.

Conclusion

The *Fishes on Cotton Farms* guide will be an important resource for land managers in north-west NSW, informing, encouraging and motivating them to conserve the habitat that adjoins rivers, creeks, wetlands and swamps on their properties. Key principles have been developed and explored to help landholders implement management actions, highlighting the relationship between the land and the water and the benefits to properties where appropriate.

The *Fishes on Cotton Farms* book will also serve as a useful guide to engage landholders and anglers, informing them of the fish species that are expected to occur in the local area and what can be done to help conserve and enhance native fish populations. This offers a great opportunity to help landholders, anglers and community groups become involved in on-ground works that will help the aquatic environment, taking advantage of assistance and funding from government organisations where possible.

To ensure the successful adoption of the guide it is important that it continues to be promoted and used at relevant events where possible. The relationships developed between government organisations, landholders and anglers will help to ensure this promotion, but these relationships must continue to be enhanced. There is also an opportunity to develop similar guides for other cotton producing parts of the country, focussing on the different irrigation methods, management actions and fish species for these areas.

Extension Opportunities

As part of the project, a successful launch of the guide was held in association with local cotton growers, anglers and government representatives. Following on from this, the guides will be distributed through contacts at the Cotton CRC, Namoi CMA and Industry and Investment NSW. There is also an opportunity to promote and distribute the guide in association with related projects and events.

Publications

There was one publication produced in association with the project: *Fishes on Cotton Farms – A guide to native fish and habitat management for north-west NSW*. Two thousand hard copies of the guide are available from the Cotton CRC, Namoi CMA and Industry and Investment NSW offices. Electronic copies of the guide will also be made available on both the Cotton CRC website (www.cottoncrc.org.au) and Industry and Investment NSW website (www.dpi.nsw.gov.au/fisheries).

Part 4 – Final Report Executive Summary

Cotton production is one of Australia's most important agricultural industries. It supports several regional economies, including those in the north-west region of NSW. A great deal has been said about the potential impact that this intensive industry may have on the surrounding environment and as such, land managers in the region are working to ensure that biodiversity in agricultural areas is maintained as part of a profitable production system. Sustainable land management includes best management practices, which aim to reduce the impact cotton production can have on the environment. Landholders are now looking for further guidance and assistance to better manage their natural systems and the animals that live within them.

The aquatic and riparian environments go 'hand in hand' with cotton production. The plants and animals that these systems support can provide a good indication of the health of that system. This is particularly true for fish populations. Native fish are very sensitive to environmental change, and the distribution and abundance of native fish species can reflect the condition of the surrounding land. The cotton industry is now working closely with natural resource managers to develop and implement 'fish friendly' practices that improve the health of rivers and waterways. It is now more widely accepted that protecting and improving the condition of riparian lands, rivers, creeks and wetlands, is a key component of sustainable land management.

To highlight the importance of maintaining and enhancing riparian and aquatic biodiversity on cotton farms, a field guide entitled *Fishes on Cotton Farms* has been produced for the north-west NSW region. The guide outlines management practices that cotton growers can employ to maintain and improve local native fish populations, as well as provide descriptions of appearance, behaviour, habitat and preferred diet for local fish species.

It is hoped that the *Fishes on Cotton Farms* guide will be an important resource for land managers in north-west NSW, informing, encouraging and motivating them to conserve the habitat that adjoins rivers, creeks, wetlands and swamps on their properties. The production, distribution and promotion of the guide offers a great opportunity to help landholders, anglers and community groups become involved in on-ground works that will help the aquatic environment, taking advantage of assistance and funding from government organisations where possible.