

Nature's workforce



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Use water for wildlife too! Provide a stimulating workplace

Well designed artificial wetlands can provide habitats for aquatic plants, birds, fish, frogs and aquatic insects and other little critters on-farm. Designs need to be practical and water use efficient.



Waterbird and wildlife habitat on a water storage on 'Hazeldean', Merah North.
Guy Roth

In summary...

The science

On-farm storages support a range of macroinvertebrate species, which provide food for birds, fish, frogs and other predators. The use of ponded wetlands, planted with aquatic plants is successful in reducing pesticides from tailwater in buffer storages on cotton farms.

Helpful hints

- Pass tail water through a filter bed to remove sediments carrying agricultural chemicals and nutrients.
- Allow some part of tail water storage to silt up and revegetate, even as a temporary

measure this can be hugely beneficial for frogs and birds.

- Include islands, shallow water, mud flats or artificial roosts and open water of varying depths in your storage and distribution system.

Benefits to the farmer

- Removal of sediments, nutrients and pesticides from water on-farm.

Are you making a difference?

- Record the number and types of birds in your water distribution system.



Cotton Catchment Communities CRC

What does the science say?

Well designed ponded wetlands for buffer storage and tailwater storage constructed on cotton farms can help to reduce the pesticides from tailwater. After only two seasons significant reductions in the half life of pesticides were recorded. These results demonstrate that macrophytes and algae in the ponds can reduce the persistence of pesticides in on-farm water storages.

Farm storages are also able to support populations of fish. A study on storages on cotton farms in Southern QLD found storages had up to 6 types of native fish which is comparable to the number of fish species found in natural wetlands. Fish communities within storages were dominated by bony bream.

Research in the Southern Tablelands of NSW showed the number of frogs found in on-farm storages in the Southern Tablelands of NSW is comparable to the numbers of frogs found in natural wetlands. Ponded wetlands on cotton farms can play an important role in providing suitable aquatic habitats vital in addressing the decline of Australia's frog species. As frogs have both aquatic and terrestrial stages the vegetation around storages is important and the amount of bare ground and emergent vegetation has been shown to be good predictors of frogs.

What can you do about it?

The Cotton Catchment Communities CRC has produced an informative fact sheet on "Design principles for healthy waterways on cotton farms" (http://web.cotton.crc.org.au/content/Catchments/Publications/Environment__NRM_Publications.aspx).

The main principles are to break larger storages into networks of smaller storages. This will decrease evaporation losses and provides different management opportunities for water. For example, "dirty water" can be held in storages with steep slopes, which discourage wildlife, and diverted away from storages with features which attract wildlife. The

second principle is to encourage diversity in design.

Measures to incorporate artificial wetlands into your storage and distribution systems need to be practical and not adversely impinge on the water use efficiency of the system. If planning to incorporate habitat features into your system you should consult the "Guidelines for Ring Tank Storages" and talk to your local Cotton Extension Officer for further advice.

Here are some suggestions.

- Construct buffer storages/ tail water storages with a variety of slopes from steep to gradual and incorporating shallow areas and mudflats.
- Pass tail water through a filter bed to remove sediments carrying agricultural chemicals and nutrients.
- Allow some part of the tail water storage to silt up and revegetate, even as a temporary measure can be hugely beneficial for frogs and birds.
- Establish a mixture of aquatic vegetation (water couch, knotweed/smartweed, phragmites).
- Provide deep water areas as refuges from predators.
- Leave standing trees/fallen trees as perches for birds.



Artificial wetland habitat features incorporated into a storage in the Namoi Valley. NSW DWE

- Include islands to reduce wave action.
- Provide sufficient flows for water bird breeding events to succeed.
- Plant Bollgard cotton next to water storages to reduce pesticide sprays near the water.

Am I making a difference?

Conduct bird surveys keeping records of species and numbers. Search an area around a central point. It can either be a small area search within 500 m or a large area search extending beyond 500 m but not farther than 5 km. Search for 20 minutes. In particular, look for the Purple Swamphen regarded as an indicator species of healthy wetlands.

- Become familiar with the local frog species, by logging onto www.fats.org.au for frog identification guides and other information about frogs.
- If you go fishing in your storage dam, make a note of what species of fish and how many you are catching.



Terns roosting on pump equipment of a storage in the Gwydir Valley. *Janelle Montgomery*

Benefits for the cotton grower

- Removal of sediment from water.
- Removal of nutrients and pesticides from the water.
- Recreational opportunity to fish.
- Attracts insect-eating birds and provides a place to enjoy the birds.

Benefits for biodiversity

- Supports aquatic plants.
- Improved water quality which creates habitats for birds, fish, aquatic invertebrates and frogs.
- Provides food and shelter for invertebrates.
- Improved water quality and increased levels of oxygen in the water.

For more information:

Web pages

<http://www.fats.org.au> (frog web site)

http://www.cotton.crc.org.au/content/Catchments/Publications/Environment__NRM_Publications.aspx

<http://live.greeningaustralia.org.au/GA/NAT/TipsAndTools/exchange/>

<http://www.carbonsmart.com.au/> Landcare Carbonsmart

<http://www.amphibeans.org>

<http://www.namoi.cma.nsw.gov.au/>

Scientific Publications

Barrett, H (ed). (1998) Guidelines for Ring Tank Storages Second Edition. Irrigation Association of Australia.

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

Hazell, D., Hero, J. Lindenmayer, D. and Cunningham, R. (2004) A comparison of constructed and natural habitat for frog conservation in an Australian agricultural landscape. *Biological Conservation* 119(1):61-71.

Rose, M. T., Sanchez-Bayo, F., Crossan, A. N. and Kennedy, I. R. (2006) Pesticide removal from cotton farm tailwater by a pilot-scale ponded wetland. *Chemosphere* 63(11):1849-1858.

