HEALTHY CATCHMENTS HEALTHY WATER

Managing land within drinking water catchments: A practical guide for NSW landholders

This document is also available in PDF format on the internet at:
www.rous.nsw.gov.au and **www.waterdirectorate.asn.au**

Healthy Catchments, Healthy Water
Managing land within drinking water catchments:
A practical guide for NSW landholders (2016).

Adapted by Rous County Council on behalf of the Water Directorate based upon the publication *Protect our waters, Protect our health – A guide for landholders on managing land in drinking water catchments*, State of Victoria's Department of Health (2010).

Acknowledgements

Rous County Council acknowledges the State of Victoria's Department of Health for granting Rous County Council permission to utilise the information within the above publication.

Published by Rous County Council 218-232 Molesworth Street, Lismore
T: 02 6623 3800 | F: 02 6622 1181 | www.rous.nsw.gov.au | council@rous.nsw.gov.au

Authorised by the Water Directorate

Main cover photo of Wilsons River, Noatharbour (NSW Northern Rivers) courtesy of Rous County Council.

Printed on 100% Recycled paper, Quality Plus Printing, Ballina NSW.

Cataloguing in publication data available from the National Library of Australia:
Healthy Catchments, Healthy Water – Managing land within drinking water catchments: A practical guide for NSW landholders. February 2016 (ISBN: 9780987088222 : Printed - Paperback)

Disclaimer

The Water Directorate and Rous County Council believe *Healthy Catchments, Healthy Water – Managing land within drinking water catchments: A practical guide for NSW landholders* to be correct at the time of printing and do not accept responsibility for any consequences arising from the use of information herein. Readers should rely on their own skill and judgement to apply information to particular issues.

HEALTHY CATCHMENTS, HEALTHY WATER

Managing land within drinking water catchments:
A practical guide for NSW landholders

Presented by

ROUS COUNTY COUNCIL

WATER DIRECTORATE

Contents

Foreword

The Water Directorate is pleased to present "Healthy Catchments, Healthy Water – Managing land within drinking water catchments: A practical guide for NSW landholders.

NSW drinking water catchments service a population of over 7 million people using our regional water supply systems. Farming and other land uses within these catchments have a direct impact on drinking water quality for the whole community. The Water Directorate and our member organisations work in partnership with the local community, government agencies and traditional Aboriginal custodians to protect drinking water quality in our catchments.

Sustainable land management practices in our water supply catchments are vital to ensure water quality is maintained at acceptable levels. Everyone has a role to play in protecting our drinking water quality. Whether you are a resident, farmer, or prospective property owner your actions can help protect the water, soil, vegetation and wildlife resources of our drinking water catchments.

This booklet aims to provide NSW landholders with practical guidelines for land management that seek to balance land use with resource protection. By reading this booklet you have taken a step towards working to protect our drinking water. The next step is to implement the systems recommended in this booklet.

The Water Directorate and our member organisations look forward to your cooperation in adopting the guidelines outlined in this booklet, and we invite you to work with us to ensure the protection of our water supply for now and into the future.

Gary Mitchell

Executive Officer
Water Directorate

March 2016

Recognition of Traditional Owners

The Water Directorate acknowledges, with great appreciation, the traditional custodians of NSW.

The water catchment areas of NSW are set amongst a landscape that is part of the identity, spirituality, cultural responsibility and resource base of the many tribes that form the Aboriginal Nations in NSW. The Water Directorate recognises the strength, resilience and capacity of these peoples.

The Water Directorate recognise the people of the Aboriginal Nations within NSW are the original custodians of the lands, waters, animals and plants of our water catchment areas. Despite the significant changes of the past 200 years, Aboriginal people still maintain a responsibility and deeply felt association with the water and the land of our catchment areas.

The Water Directorate acknowledges and respects this relationship and the traditional laws, customs, beliefs and culture of the Aboriginal community. The Water Directorate considers that the recognition and conservation of local Aboriginal culture in partnership with local Aboriginal people is an important part of the management of our water supply catchments.

Aboriginal people have been connected to what is now known as NSW for over 40,000 years. The Water Directorate recognises and respects the knowledge that Aboriginal people have in managing land and conserving biodiversity. The Water Directorate considers Aboriginal people as equal partners in managing our land and water. Caring for country is a cultural obligation and a birthright. Cultural knowledge supports sustainable living practices and strengthens identity and connection.

As a land manager, this guide will help you to care for country.

Protecting drinking water catchments benefits the community, the environment and the landholder.

Photo © NSW Department of Primary Industries

Introduction

Water is essential to sustain life. Our health depends on having an adequate supply of safe drinking water. Many of us take the quality of drinking water for granted. When you turn on the tap, you expect safe and pleasant-tasting water.

Many towns in NSW rely on drinking water sourced from natural waterways. If the source becomes contaminated, the safety of community drinking water supplies can be affected. Contamination of water catchment areas is recognised as a leading cause of illness around the world by numerous organisational bodies, including the World Health Organization (WHO). Therefore, the condition of the source (water catchment) is a crucial factor in the quality of such community drinking water supplies.

In NSW, protecting the environment, including our waterways, is a responsibility shared by government, industry, businesses, communities and individuals. Landholders in particular, have a responsibility to manage their activities so as to avoid polluting waterways.

> *"The actions of landholders can have a significant impact on the quality of drinking water supplied to surrounding communities."*

Catchment management is an essential part of the multi-barrier approach that has been recognised by WHO and, in Australia, by the National Health and Medical Research Council's 2011 'Australian Drinking Water Quality Guidelines' (ADWG) updated 2013. The ADWG state that 'prevention of contamination provides greater surety than removal of contaminants by treatment, so the most effective barrier is protection of source water to the maximum degree practical'.

This booklet:

- Describes the various contaminants that can enter waterways as a result of agricultural activities and development, and can present a risk to the health of our community
- Describes the sources of these contaminants and how they can be controlled by landholders
- Considers planning issues and some generic principles that can be adopted by all NSW landholders to protect our drinking water supply.

By controlling the various contaminants entering our streams and waterways, you will not only help protect the health of the surrounding community, but you can also:

- Create sustainable farming practices
- Save money on farm operations
- Have a positive impact on the overall environment
- Create healthier, better-looking and therefore more valuable land.

This booklet explains the important things to consider when managing land in a water catchment. Though not all of the described management practices may be applicable to your individual circumstances, you are encouraged to follow the guidance for those that are. This booklet can help you manage your land more effectively and protect drinking water supplies for the community through:

- Improving the condition of waterway frontages with vegetation
- Preventing stock access to waterways
- Maintaining onsite wastewater treatment systems (e.g. septic tanks)
- Preventing soil erosion
- Using and managing nutrients wisely
- Improving agricultural chemical use
- Carefully considering land use practices.

Poor catchment conditions not only affect river health and the environment, but can also affect drinking water quality and, therefore, the health of communities.

Photo © Rous County Council

PART 1

Protecting NSW's drinking water catchments

A reliable supply of quality drinking water is essential to community health and wellbeing. Poor-quality drinking water supplies place communities at risk from water-borne disease. To minimise this risk, it is necessary to reduce the sources of contamination in our catchment areas, and avoid over-reliance on water treatment processes as the sole barrier in management of drinking water quality.

1.1 What is a drinking water catchment?

A catchment is an area of land where water is collected by the natural landscape (refer to Figure 1). In a catchment all rain and run-off water makes its way to a low point in the landscape, such as a stream, river, wetland, ocean, or underground into the groundwater system. During periods of low rainfall the groundwater system can slowly feed water into the river system.

Water catchments vary in size and composition. They can contain large areas of developed land or can be areas within national and state forest or parks. Catchments can include major drainage networks of rivers and creeks. They are often comprised of hundreds of smaller sub-catchment areas.

Healthy catchments provide a source of clean drinking water, habitat for plants and animals, natural vegetation and waterways for recreation, reliable and clean water for livestock and irrigation, and opportunities for sustainable agriculture and industry.

Community drinking water supplies are mainly drawn from two sources: surface water (rainfall and its runoff) and groundwater (water that has collected in underground stores or aquifers). Both sources are recharged from catchments.

Types of drinking water catchments

There are two types of water catchments:

- Closed water catchments are often forested and are not accessible to the general public. Often they are managed by a single entity.
- Open water catchments are accessible to the public – the land is privately and/or publicly managed over many land titles by the rural community or by government agencies.

The NSW Department of Primary Industries (DPI) Water is responsible for the management of the state's surface water and groundwater resources.

NSW water catchments include near-pristine areas such as the Blue Mountains catchment which lies mostly within the World Heritage listed Blue Mountains National Park, and multiple-use catchments such as the catchment areas of the Murray-Darling Basin.

There are over 100 different water utilities in NSW that manage the supply of water for domestic use, livestock and irrigation purposes. These water utilities often also provide sewage treatment, drainage and salinity mitigation services. Some water utilities also manage bulk water storage and recreational areas.

> *Rivers, dams, wetlands, bush, plants, animals, towns, farms and people can co-exist in a catchment.*

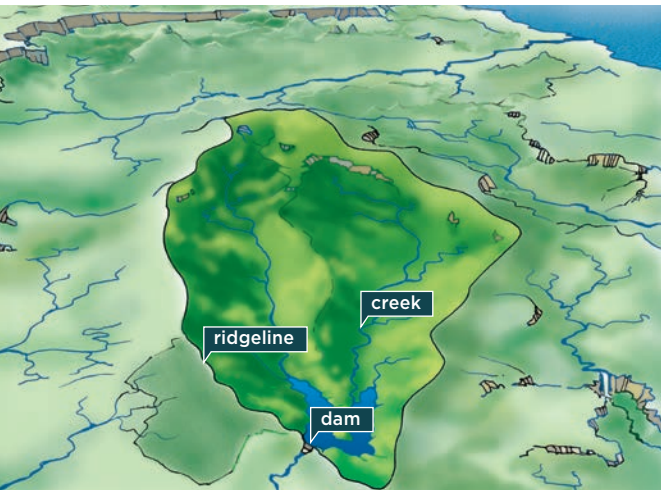


FIGURE 1: *A catchment is an area of land bounded by natural features where water is collected.*

What does this mean for landholders?

Many waterways in rural and regional NSW lead to a point where drinking water is sourced. If your property drains to a point where raw water from a surface water or groundwater source is drawn, captured or stored for drinking water purposes, you live in a drinking water catchment.

You do not have to have a waterway, such as a continuously flowing creek or river, on your property to be designated as 'living in a water catchment'. Catchments sometimes contain waterways that are dry for extended periods. They may not always be visible, but these also need to be protected.

It is important to note that the management practices detailed in this booklet are relevant to water catchments in general, not just drinking water catchments.

If you are unsure if your property is in a drinking water catchment, contact your local water utility, council or Local Land Services (LLS).

> *You live in a drinking water catchment if your property drains to a source that is used for drinking water.*

1.2 Why do catchments need to be protected?

The quality of the drinking water that communities receive from catchments is dependent on how people living and working in the catchments manage and interact with it. The way we manage water, livestock, land and gardens, design homes, dispose of waste, collect firewood, treat waterways, and care for trees and other vegetation all affect our catchment. What happens in one part of the catchment is likely to have an effect elsewhere.

Poor land management practices affect river water and groundwater quality (refer to Part 2. How can landholders protect waterways?). This can affect the health of the environment and put stress on the drinking water treatment process. Without proper consideration and planning, silt and many kinds of waste can end up in our waterways, which can have a negative impact on human health.

To avoid these potential risks to public health, development and use of land within our drinking water catchment areas must be managed to optimise the quality of water collected from the catchment.

Increased contaminant loads in source waters can impair the effectiveness of water treatment processes. Some contaminants cannot be removed from water through treatment, so preventing water contamination is best.

1.3 How is water made safe to drink?

Drinking water collected from our catchments is made safe by a combination of protection and treatment methods. These methods include:

- Protecting the catchments and source water
- Holding water in protected reservoirs or storage
- Treating and disinfecting the water
- Protecting and maintaining the distribution system.

The water treatment process is essential for reducing contaminants in the water supply. Better quality water at the catchment source means:

- Water treatment is likely to be more effective
- Risk of water-borne diseases affecting your family, neighbors and friends is reduced
- Fewer chemicals need to be added to the water
- Water tastes better.

The condition of the catchment area is one of the most important factors influencing the quality of drinking water. Remember that what you do on your property can affect the quality of drinking water in surrounding towns.

1.4 What are contaminants and how do they enter our waterways?

Types of contaminants

Certain contaminants in water are deemed hazardous and can pose a significant risk to public health and the health of the natural environment. They include:

- **Pathogens** (disease-causing microorganisms) from stock faeces, feral animals and human waste
- **Sediment** from erosion and the disturbance of stream banks
- **Chemicals** from pesticides, herbicides, hydrocarbons (fuels) and inappropriate waste disposal
- **Nutrients** from fertilisers as well as from stock faeces and urine.

Hazards in water are pathogens, sediment, chemicals and nutrients.

A treatment process separating particulate matter from drinking water

Pathogens

Pathogens in drinking water pose the greatest risk to human health. These pathogens include certain bacteria, viruses and protozoa. Many outbreaks of disease have been linked to the consumption of drinking water contaminated by human or animal waste (faeces).

Pathogens in drinking water pose the greatest risk to human health.

Drinking water collected from our catchment is made safe by a combination of protection and treatment methods

Murray River algae bloom

Checking for pathogens in a river

Sediment

Erosion from catchment surfaces due to exposure of bare soil and rock as a result of catchment disturbances can be a major contributor to suspended sediments, leading to poor source water quality. Sediment can be transported by surface water movement to waterways increasing turbidity, reducing photosynthesis, and smothering benthic habitat. Sediment transported downstream is deposited at low stream flows in pools reducing habitat quality and availability. Turbidity can also be associated with increased risk of excessive nutrient loads and microbial contamination of water.

Supplying water from sediment-heavy catchments negatively affects treatment plant performance and may impact the quality of drinking water after treatment. By reducing the sediment entering the raw water supply, the quality of water reaching the treatment plant is improved.

Chemicals

If chemicals are not used or managed appropriately, chemical residue can end up in our drinking water supplies. Some chemicals:

- Are transported by water or attach to soil particles
- Take many years to break down in the environment
- Are not always removed by the water treatment process.

Chemicals can end up in our water due to:

- Runoff from land into stormwater and agricultural drains or waterways after rainfall
- Misuse or inappropriate disposal near waterways or within catchments.

Nutrients

Excessive nutrient loads in catchments – particularly phosphorous and nitrogen – affect water quality and can lead to an increase in algae growth. Algal blooms may result from the combination of increased nutrient loads from runoff containing sediment and fertilisers, along with warm weather, sunlight and little water movement. Many algal blooms are toxic. They can make the water unsuitable for consumption by humans and animals, and require extensive water treatment.

Human impacts

Many contaminants in water are found naturally. However, many others result from a range of human activities. These activities include:

- Inadequately treated sewage or poorly maintained sewerage systems (such as wastewater treatment systems, including septic tanks)
- Animal waste from poorly managed agricultural practices
- Improper use and/or management of chemicals
- Inappropriate disposal of waste materials (waste gets caught up in storm water runoff or groundwater flow and eventually enters the raw water supply)
- Poor land management practices leading to soil erosion
- Soil disturbance from poorly managed road maintenance and building sites
- Leaching from poorly sealed waste-holding dams
- Waste from recreational activities, such as camping, fishing and boating.

Photo Credits – Part 1

13 | *A treatment process separating particulate matter from drinking water.*
Photo © Rous County Council

Drinking water collected from our catchment is made safe by a combination of protection and treatment methods.
Photo © Rous County Council

14 | *Murray River algae bloom.*
Photo © NSW Department of Primary Industries

Checking for pathogens in a river.
Photo © NSW Department of Primary Industries

Protecting drinking water catchments provides a source of clean drinking water, habitat for plants and animals, natural vegetation and waterways for recreation, and reliable and clean water for sustainable agriculture.

Photo © NSW Department of Primary Industries

PART 2

How can landholders protect waterways?

The activities of landholders can have a direct effect on the community drinking water supply. This section highlights areas where you can contribute to catchment water quality by controlling hazards, and discusses issues to consider and what actions you should take.

> *Eventually, the water from drinking water catchment areas is consumed by people so everything we do to protect these catchments contributes to drinking water quality.*

By controlling hazards to drinking water quality, you can:

- Create sustainable farming practices
- Save money on farm operations
- Have a positive impact on the overall environment
- Create healthier, better-looking and therefore more valuable land

Eventually, water that runs off a drinking water catchment area will be consumed by people. Every control measure counts and contributes to the quality of drinking water supplies.

Take the following actions on your land to improve the condition of drinking water catchments:

- Improve the condition of waterway frontages with vegetation
- Prevent stock access to waterways
- Maintain onsite wastewater treatment systems
- Prevent soil erosion
- Use and manage nutrients appropriately
- Use and manage all chemicals appropriately
- Plan and develop conscientiously
- Consider implementing your own waste management plan for waste associated with your property
- Ensure you have the right approvals for any proposed development
- Develop and/or maintain appropriate buffers.

Refer to **Part 3** which includes relevant resources and contacts.

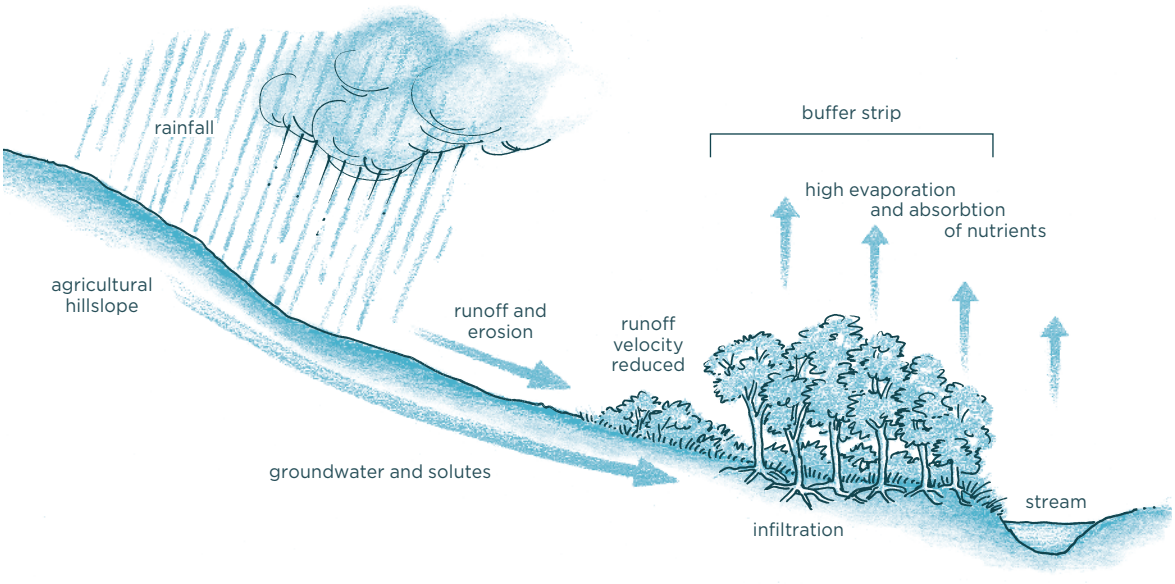


FIGURE 2: *Diagram showing the overall concept of the functions of a riparian buffer zone.*
Source: Riparian Land Management Technical Guidelines. Volume One: Principles of Sound Management. LWRRDC (1999).

10 GOOD REASONS TO PROTECT WATERWAY FRONTAGES

- Healthier waterways
- Better water quality
- Improved biodiversity and healthier ecosystems
- Decreased erosion
- Decreased algal growth
- Fewer insect pests
- Reduced risk of stock injury and loss
- Soil retains more nutrients
- Provision of windbreaks and shelter
- Healthier, better looking and therefore more valuable land.

2.1 Improve the condition of waterway frontages with vegetation

The condition of land fronting natural waterways, including riverbanks – also known as riparian land – directly influences the body of water. Well-managed frontages reduce the amount of material that ends up in waterways and reservoirs.

Planned management of land adjacent to natural waterways is an essential part of sustainable property management. It can yield numerous benefits – including increased productivity (some of these benefits are described in the box to the left).

Financial assistance may be available for fencing and the creation and maintenance of vegetated land alongside waterways. Contact your local water utility, Landcare or LLS for further information (refer to Section 3.3).

Slowing runoff

Vegetation on waterway frontages slows the overland movement of runoff water and acts as a filter or buffer to trap sediment, nutrients and other contaminants. This is desirable because reducing the movement of contaminants into the waterways will improve water quality.

Reducing erosion

Degraded vegetation alongside waterways make the banks more prone to erosion. Flows from heavy rainfall result in increased waterway volumes, which scour the riverbanks if they are not well reinforced with riparian vegetation.

Heavy rainfall can also wash large amounts of soils, which potentially contain harmful contaminants, from the catchment into storage reservoirs. It can also mix water and sediment within reservoirs, stirring up settled microorganisms and other matter.

Stabilising riverbanks

Planting of appropriate species on waterway frontages can help to stabilise riverbanks and protect them in times of flood. The roots of vegetation reinforce soil (like steel rods reinforcing concrete). Root reinforcement by waterway frontage vegetation is usually the most important safeguard against bank collapse. Fine roots are more important in this process than thick roots.

Riverbanks often collapse when they are saturated with water. Vegetation on the face of the riverbank helps to support the soil above it so it does not collapse. It also helps by taking up the water and improving the soil's drainage. Subject to site specific geomorphological considerations, there may be a need to protect banks and planted areas whilst the plantings are established – this could include the use of netting or mass rock protections.

Vegetation filters and traps contaminants

Riparian vegetation stabilises riverbanks and prevents erosion

Plants stabilise riverbanks and prevent erosion.

Choosing vegetation

Always select a range of indigenous plants – try to copy nature. When revegetating to reduce bank erosion, consider:

- Siting and the selection of appropriate plant species – avoid species that might obstruct the waterway during high-flow events
- Establishing vegetation all over the bank surface – not just on the top
- Selecting a range of plant species so the revegetation mimics the native or indigenous vegetation of the area
- Choosing smaller plants for planting near the lowest part of the bank.

Native grasses, reeds and shrubs with flexible stems and branches often naturally occupy the lowest sections of the bank. These plant types bind soil and resist flood flows well.

> *Choose local indigenous plants where possible. Ask your native plant nursery for advice.*

Further up the bank, shrubs and small trees may predominate, mixed with grass species.

Advice on selecting native or indigenous species to plant can be obtained by contacting Landcare, LLS or a reputable native plant nursery.

Vegetated land alongside waterways should be wide enough to maintain the natural drainage function, minimise erosion of stream banks and reduce contaminants from surface runoff from the adjacent land. The width of vegetated land adjacent to waterways is subject to local conditions and the use of the land that it abuts.

Fencing

To protect waterways and the adjacent land, fencing should be erected between the vegetated water frontage (riparian zone) and the rest of the property. This prevents stock from entering the waterways, causing erosion and/or introducing contaminants (refer to Section 2.2).

Choose indigenous plants. Ask your local native plant nursery for advice.

WHY SHOULD I USE INDIGENOUS PLANTS?

Indigenous plants have adapted over thousands of years to the conditions in your locality and will cope better with the climate, soils, extreme weather events and native predators than plant species from elsewhere in Australia or overseas.

They also provide the most benefit to the environment; local birds, mammals, reptiles, amphibians and insects have adapted to them, and plants and animals are often reliant upon each other for survival. Planting an appropriate mix of indigenous species will lead to a more biologically diverse property.

Section 3.1.4 provides information about incentive schemes that provide landholders with financial assistance for protecting and managing native vegetation. This section also provides information on the relationship between native vegetation, land and water health.

2.2 Manage stock to protect drinking water catchments

Prevent stock access to waterways

Preventing stock access to waterways is an integral part of good land management. It helps protect:

- Drinking water supplies
- The health of our waterways
- Land and vegetation adjacent to waterways.

Stock accessing natural waterways affects the adjacent environment by depleting vegetation and increasing the risk of erosion. This affects river health and water quality by introducing:

- Pathogens from stock faeces or stock carcasses, causing an increased risk of disease
- Nutrients from faeces and urine, causing an increase in the risk of blue-green algae blooms (some of which are toxic)
- Sediment from erosion and disturbance of stream banks, which harms aquatic life, clogs streams and places a burden on the drinking water treatment process.

Stock should be prevented from accessing waterways and provided with alternative water supplies.

ACTIONS TO MANAGE STOCK AND PROTECT WATER QUALITY

- Fence off waterways
- Provide stock with alternative drinking water supplies
- Provide adequate shade in grazing paddocks
- Consider rotational grazing

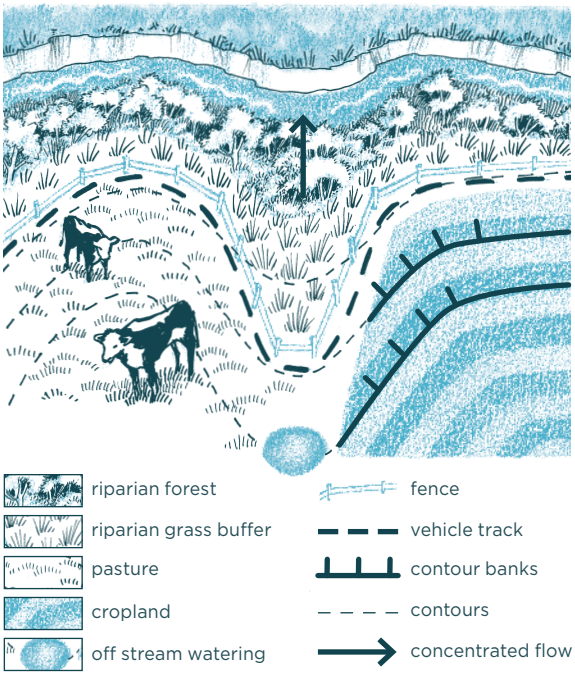


FIGURE 3: *Diagram depicting good on-farm management practices that protect water quality. Source: Riparian Land Management Technical Guidelines. Volume Two: On-ground Management Tools and Techniques. LWRRDC (1999).*

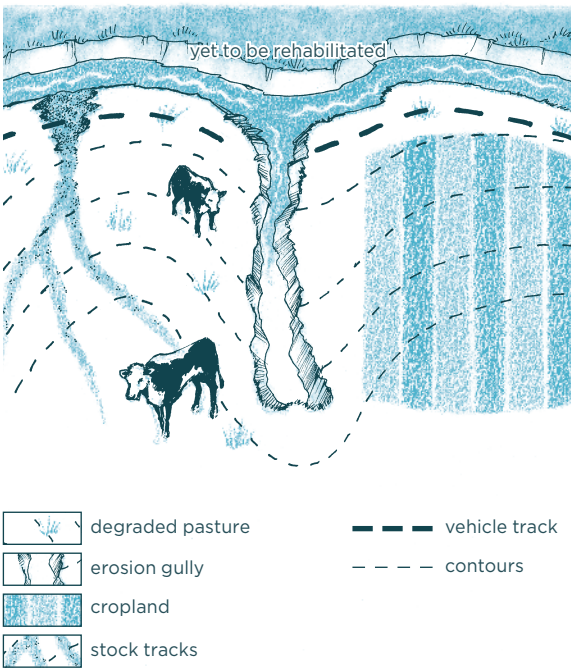


FIGURE 4: *Diagram showing degraded catchment and riparian land. Significant sediment and nutrient is derived from degraded pasture, poor crop management, unlimited stock access and gully erosion. Source: Riparian Land Management Technical Guidelines. Volume Two: On-ground Management Tools and Techniques. LWRRDC (1999).*

Drinking contaminated water affects the health of people and animals.

Protect water quality by keeping stock out of waterways

Provide off stream watering points for stock

Manage stock numbers

When assessing stock numbers, remember to take into account the capability of the land to sustain grazing in each season and the potential risks that overstocking may have on catchments.

Overstocking can cause a depletion of ground cover vegetation, leading to soil erosion. This, in turn, causes sediment and potentially other contaminants to enter waterways.

Rotational grazing allows grasses on grazed areas to regenerate and allows them to continue to act as a buffer to trap sediments, nutrients and other contaminants moving over the land.

Keep calves out of waterways

As noted above, farm animal waste (faeces) contains pathogens (disease causing microorganisms). Faeces from calves, in particular, contain higher quantities of pathogens. Therefore, priority should be given to keeping calves out of waterways. Pathogens contaminating drinking water can cause serious outbreaks of disease.

Provide stock watering troughs and shade

Water pumped from a waterway to stock watering troughs is of better quality than river water that stock have been walking or standing in. Better quality water is better for stock.

Providing a shaded, clean watering trough or providing a watering trough closer to preferred pastures can significantly reduce the amount of time stock spend in unfenced riparian areas.

Adequate shade and drinking water troughs provided on the property also help prevent stock from forcing their way into fenced riparian land.

Financial assistance may be available for fencing and the installation of off stream watering points. Contact your local water utility, Landcare or LLS for more information.
Section 3.1.8 provides links for managing stock to protect drinking water quality.

2.3 Maintain onsite sewage management systems

Poorly designed, installed, operated and/or maintained onsite sewage management systems (OSMS) can release pathogens into groundwater and surface water. If this occurs in a drinking water catchment, the drinking water source may become contaminated.

All OSMS need on-going care and maintenance if they are to continue to function properly and not cause pollution that ends up in waterways. The maintenance of onsite systems (such as septic tanks, composting toilets or aerated systems) requires attention to not only the treatment unit, but also the land areas surrounding it. OSMS should be located well clear of runoff and drainage lines.

OSMS operate primarily through the biological digestion of organic matter. Detergents, disinfectants and other household materials affect or kill the bacterial action within these systems – making them ineffective – so the disposal of such substances into the onsite systems should be avoided. It is also critical that rubbish is not disposed of through such systems (including items such as sanitary napkins, disposable nappies, plastics and so on).

NSW Health conducts an accreditation process that regulates the type of OSMS that may be installed in NSW. The accredited systems can be viewed at www.health.nsw.gov.au/environment/domesticwastewater.

A failing septic or wastewater treatment system can have serious impacts on human health and the environment.

There are special regulations that apply to these systems. As the owner of the property, it is your responsibility to ensure that the system is approved by your local council and that it is working properly. OSMS can be a risk to the health of your family and other community members if they are not properly maintained. They can also cause harm to the environment.

To ensure that your system meets requirements, you will need to obtain two approvals from your local council. The first approval is to install the system. The second approval is to operate the system. Having both approvals will give you assurance that your system has been designed and is operating the way it should be. Having a properly working system will save you both time and money.

After you obtain these approvals, your council will carry out regular inspections to make sure the system is working properly. Councils may charge inspection fees for this service.

Get advice on the proper care and use of wastewater treatment systems from the relevant Environmental Department at your local council or from the system manufacturer.

Section 3.1.6 provides links to information, including the Office of Local Government's Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households.

If you suspect your system is not operating as it should, consult a licensed plumber with experience in onsite wastewater treatment systems.

2.4 Prevent soil erosion

Soil erosion commonly occurs as a result of overgrazing, excessive tree removal and/or over-cultivation. Soil erosion affects water quality and the productivity of your land. When erosion occurs, valuable topsoil is lost, and nutrients from the soil enter waterways. Furthermore, there can be an increased risk of stock injury, and the value of the property can be affected.

Maintain continuous ground cover in an orchard to prevent soil erosion

Stabilise stream banks to prevent soil erosion

ACTIONS TO PREVENT SOIL EROSION

- Stabilise stream banks
- Prepare and implement a farm plan
- Maintain continuous ground cover
- Provide windbreaks
- Establish well-situated vegetable and garden beds
- Restrict damaging activity on slopes

Effective control of soil erosion can be achieved by:

- Developing a farm plan (refer to Section 3.1.2)
- Stabilising stream banks by planting riparian vegetation and controlling stock access
- Establishing continuous ground cover through pasture improvement and the planting of native vegetation
- Maintaining continuous ground cover by not overstocking and over-cultivating and, where necessary, restricting stock access
- Establishing windbreaks using trees, tall dense shrubs or built materials
- Placing vegetable and garden beds across rather than down sloping ground, to minimise the loss of topsoil and residue runoff that may contain sediment, fertilisers and pesticides
- Restricting horse-riding and off-road vehicle (e.g. Quad and trail bikes) use to flat areas on your property and sticking to existing tracks to avoid creating areas of bare land. Hoofed animals disturb the soil, as do off-road vehicles.

Trees and shrubs

Trees play an important role in protecting our drinking water catchment areas. Waterways are seriously affected by clearing and the degradation of native vegetation.

Land alongside waterways should have an adequate tree and shrub buffer. Existing vegetation

on the rest of your land should be preserved as much as possible. Trees and shrubs not only provide valuable habitat for wildlife, and shade and shelter for stock, but they also prevent erosion – particularly on steeper slopes. Indigenous native vegetation should be chosen as a preference when improvements are being made and tree planting is being considered.

Clearing of vegetation from the landscape increases:

- Erosion
- Runoff (which carries more sediment, nutrients and pollutants such as agricultural chemicals into waterways)
- Groundwater and thus the risk of surface waterlogging and salinity impacts
- Costs associated with loss of land and stock damage.

Vegetation slows overland movement of runoff water and acts as a filter to trap sediment (refer to Section 2.1). The roots also reinforce the soil, thereby preventing erosion.

Over-clearing and intensive development of a catchment usually results in more water moving quickly off the land surface in times of heavy rain. Sometimes river channels cannot cope with the extra flow, the water level rises, riverbanks are broken and flood damage can result. If land is not well vegetated heavy rain can strip topsoil from pastures, erode riverbanks and, in extreme cases, force the creation of new river channels. Apart from the obvious impact on water quality, this leads to the loss of valuable agricultural land.

Snags

Trees and logs in waterways can play an important role in providing habitat and breeding areas for fish and other aquatic species, assisting with the stabilisation of the bed and banks and reducing flow velocities. Removing snags of native timber requires a permit (refer to Section 3.1.8).

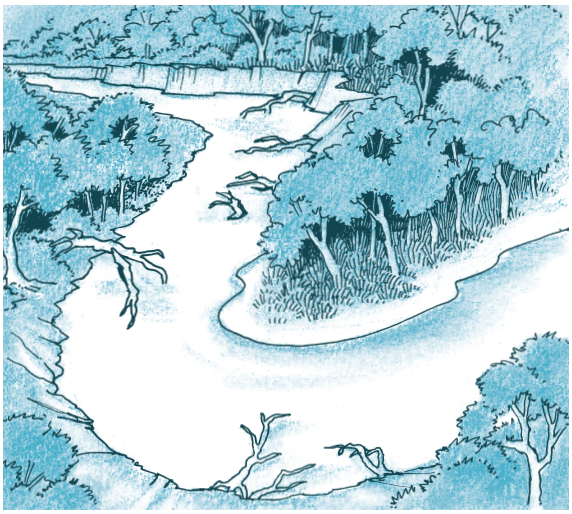


FIGURE 5: *The best location to position snags is on the outside and downstream end of bends. Source: Riparian Land Management Technical Guidelines. Volume Two: On-ground Management Tools and Techniques. LWRRDC (1999).*

Sand, soil and gravel extraction

You should not remove soil, gravel or similar materials from creek banks, flood plains, wet areas, steep slopes and existing unstable areas. Where possible, you should obtain your fill requirements from outside the drinking water supply catchment area.

These works will trigger either a Controlled Activity Approval, Dredging and Reclamation Permit or Crown Lands Licence (refer to Section 3.1.8).

Check before you cut down trees or remove them from waterways – you might need a permit.

Section 3.1.5 provides links to specific documents on soil erosion.

Section 3.1.4 provides a link to the LLS website for incentive schemes providing landholders with financial assistance for protecting and managing vegetation.

Section 3.1.8 provides links to guidelines for managing waterways and adjacent areas, including the management of large woody debris.

2.5 Use and manage nutrients wisely

Fertilisers

Inappropriate or excessive use of fertilisers can lead to nutrient runoff into waterways, increased costs to the landholder and reduction in the quality of produce.

Wherever possible:

- Time your fertiliser applications to avoid periods of intense runoff – do not apply fertiliser when the soil is saturated or rain is forecasted
- Place fertiliser within the soil or under surface vegetation and avoid the use of broadcast applications
- Apply fertilisers as the plants need them by giving several light applications rather than one heavy dose
- Apply soluble fertiliser through an irrigation system with drippers or low-pressure micro-jets
- Use stubble mulching, trash blanketing and other methods to protect soils from water and wind erosion to help keep the nutrients where they should be (on the paddock, waiting for the next crop or supporting increased pasture growth)

Use and manage fertilisers wisely to reduce nutrient runoff into waterways.

ACTIONS TO FERTILISE WISELY

- Time fertiliser applications
- Fertilise within soil and under surface vegetation
- Avoid broadcast applications
- Fertilise via low pressure irrigation
- Test soil regularly
- Use lighter, more frequent applications
- Protect soils from erosion

- Consider land forming and the use of contour banks to help reduce the amount of soil and nutrients lost from paddocks
- Test your soil regularly to assist in determining your soil's nutrient and trace element requirements.

Commercial fertilisers inappropriately applied to home gardens can run off and end up in local waterways (up to half of the nitrogen from fertiliser applied to lawns ends up as water pollution). Alternatives include the use of natural fertilisers, such as compost and worm castings, and replacing lawns with native plants and shrubs.

> *"Use nutrients appropriately to maximise their benefits."*

Section 3.1.7 provides links to the Department of Primary Industries (DPI) and NSW Environment Protection Authority (EPA) information on managing farm waste.

Section 3.1.2 has information for dairy farmers on the Dairy Self-Assessment Tool (DairySAT) for better management practice.

For further information on the use of fertilisers, refer to **Section 3.1.3**.

Manure stockpiling and dairy effluent

Inappropriate stockpiling of animal manures can lead to the contamination of waterways following rain or irrigation.

If stockpiling is necessary:

- Ensure the pile is sited on flat ground away from drainage lines
- Cover the manure during wet weather to prevent nutrients washing into waterways
- Bund stockpiles, where appropriate.

Dairy effluent is a potential source of nutrient pollution (as well as pathogens) in waterways. Dairying remains an important land use in NSW and so the overall management of dairy effluent is an important factor in avoiding serious impacts on the environment. Reducing the amount of effluent waste requiring storage and treatment can also create operational benefits.

Other sources of nutrient runoff

In addition to fertiliser runoff, large amounts of nutrients can enter waterways from soil erosion (refer to Section 2.4), wastewater treatment systems (refer to Section 2.3), even inappropriate stockpiling of mulch and mill mud can cause problems. Therefore, controlling these sources is also important.

2.6 Use and manage chemicals wisely

Chemicals must not be used in a way that causes damage to waterways or damage to plants and stock beyond the targeted area (i.e. beyond your property boundary).

Choose chemicals that are less harmful and less persistent in the environment, but still give the desired control. Chemical use should be minimised where possible.

Integrated pest management / Integrated weed management

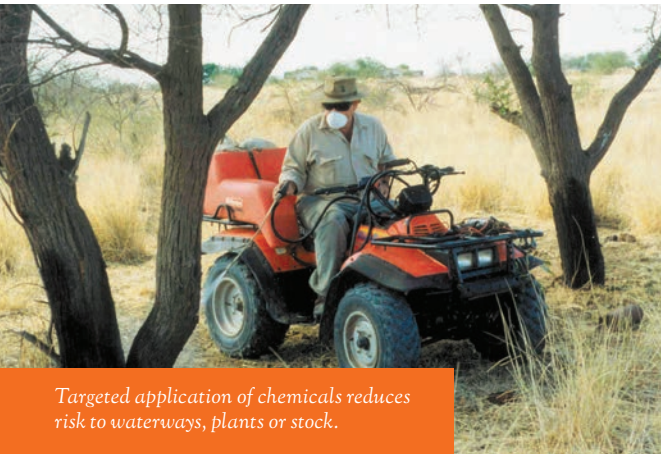
Consider using an Integrated Pest or Weed Management (IPM or IWM) approach, utilising a range of alternatives to chemicals, such as biological or mechanical controls (or use in conjunction with chemicals to reduce chemical use).

Effective IPM (or IWM) can often lead to reductions in production costs in the long-term. It can also limit the build-up of chemical resistance in pests and weeds. This means improved productivity and more effective weed or pest control.

Spills and storage

- Spills of oil, petroleum, agricultural and industrial chemicals can seriously pollute catchment streams. Store chemicals wisely
- Situate a dedicated and secure chemical storage facility away from drainage lines. The storage facility should be on flat land with bunding to contain any spills
- Ensure that the volume of chemicals doesn't exceed any bund limits that you have in place
- Chemicals and fuel should be stored above flood levels to avoid water contamination in a flood or overland flow event
- Chemicals should be stored in their original containers. Labels must not be removed. All containers must be sealed properly
- In the event of a spill, contact your local water supply authority or EPA so that they can respond to the situation, if needed
- Consider obtaining a chemical or fuel spill kit
- Useful items to keep in a spill kit (or other easily accessible location) include absorbent socks, kitty litter, drain covers, scoops, gloves, glasses and bags for waste disposal.

Parasitic wasp eggs used as an alternative to chemicals for combating pests in a macadamia orchard



Targeted application of chemicals reduces risk to waterways, plants or stock.

Targeted application

Carefully identify the pests, weeds or diseases before applying chemicals. Apart from wasting money, unnecessary spraying can create other problems, such as chemical resistance and damage to beneficial species. Once identified, determine if the pest, weed or disease is present at a level likely to cause economic damage.

Do not spray in or near watercourses or on windy days.

Suitable spraying equipment and conditions are important to ensure off-target drift is avoided.

Follow instructions

Read all chemical labels and make sure you understand them before using any chemicals. Always use chemicals according to instructions. Environment-related information is usually in the 'Protection of Wildlife, Fish, Crustaceans and Environment' section of the label.

Follow official requirements and guidelines

There are a range of Acts and Regulations controlling the use of chemicals. The use of some chemicals is restricted in several areas of NSW. For further information refer to Section 3.1.3 or contact the DPI.

ACTIONS FOR TAKING CARE WITH CHEMICALS

- Store wisely
- Follow instructions listed on the label
- Manage spills appropriately
- Targeted application is best
- Dispose of safely
- Follow the rules of use
- Seek training, if required
- Install a chemical spill kit for easy clean-up

Dispose of chemicals safely

Follow label instructions for disposal of all agricultural chemicals. Rinsing and wash-down water must not be allowed to drain into groundwater, storm water drains or water supplies.

Dispose of empty chemical containers by returning them to the supplier (if recyclable) or disposing of the empty container through a disposal program (such as 'drumMUSTER' www.drummuster.com.au).

Dispose of excess or unwanted chemicals through 'ChemClear', a program to collect unwanted rural chemicals. Information is available from ChemClear (Ph. 1800 008 182 or check their website www.chemclear.com.au).

Chemical user training

Many farmers undertake farm chemical user courses on a voluntary basis or as a requirement of the NSW Pesticides Act, 1999 to use certain chemicals. These courses inform about correct application rates, safe use and safe storage. The EPA website contains useful information about chemicals and pesticides, including information about compulsory training in pesticide use.

Section 3.1.3 provides links to further information on chemical use, including the DPI's range of information on dealing with agricultural chemicals (such as chemical user courses).

2.7 Plan and develop land conscientiously

Whether you are purchasing land or already have a property, proper planning and development of your land will help protect the environment as well as maintaining the value of the land and your investment in the long term.

> *Proper planning and development of land helps protect the environment and maintain land value.*

Before buying land

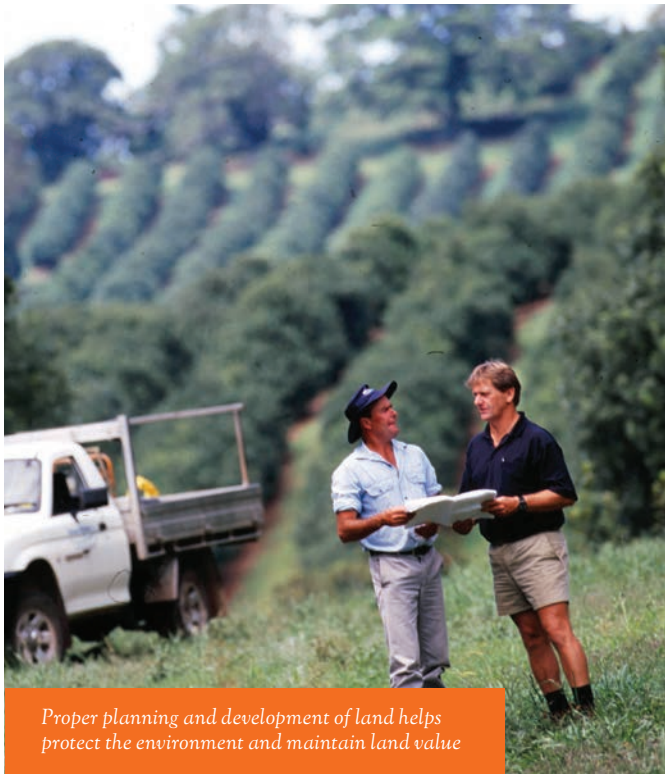
There are several publications that summarise the issues you should consider when purchasing a rural property, listing services and information for new landholders including managing a small property and the main areas of law and legal compliance obligations associated with living in rural areas. Section 3.2 lists some of these publications.

Planning controls

Many local planning schemes contain a requirement for certain kinds of permit applications within catchment areas to be referred to another authority or body (such as the relevant water supplier) for comment or review.

Do your homework and find out what controls apply to the land by speaking to the planning section of your local council. Find out if any planning scheme controls apply to the land, particularly drinking water catchment overlays. The presence of these overlays can also place restrictions on the future use and development of that land.

Local Environmental Plans control and guide planning decisions and proposed development for local government areas. Through zoning and development controls, they allow councils to supervise the ways in which land is used.



Proper planning and development of land helps protect the environment and maintain land value

Development Control Plans, prepared in accordance with the *Environmental Planning and Assessment Act, 1979* are also used to help achieve the objectives of the local plan by providing specific, comprehensive requirements for certain types of development or locations. Specific provisions may be required in order to undertake development in drinking water catchment areas.

Environmental planning instruments (State Environmental Planning Policies and Local Environmental Plans) are legal documents that regulate land use and development.

Planning approvals

Local councils, in consultation with government agencies and their communities, have the responsibility of determining land use. Because of the risks to public health, all use and development on land within drinking water catchment areas should be managed and sited to protect the quality of water collected from the catchment area. These issues are considered during the assessment process for development applications associated with properties in open drinking water supply catchment areas.

Residential development and agriculture have the potential to adversely impact water quality through the discharge of contaminated runoff and waste, nutrient contributions or sediment to waterways.

Before commencing any development of your land, contact your local council planning section to ensure your proposed development is permitted. Some developments that require council approval are:

- Onsite sewage management systems (e.g. Septic tanks)
- Certain buildings and works (e.g. Land forming and levee bank construction)
- Certain agricultural activities.

> *Septic tanks, and poor agricultural, building or works practices and techniques are all sources of contaminants.*

Agricultural activities

Certain activities may be prohibited in declared water supply catchments. It is crucial that you consult with your local council to find out what planning requirements relate to your proposed development such as Local Environmental Plans, Development Control Plans, Regional Environmental Plans and State Environmental Planning Policies.

> *Always contact your local council planning section before building, developing your land or carrying out a new agricultural business.*

Any proposed development must comply with your council's Local Environmental Plan and any State Environmental Planning Policies (SEPP) that apply to the type of development, in particular SEPP 30 – Intensive Agriculture. These plans and policies are legislation and can be found at www.legislation.nsw.gov.au

Before committing to developing a particular site for intensive agricultural activities, you must determine whether the activity you propose is permitted without consent, requires consent or is prohibited. Intensive agriculture includes industries such as poultry, piggeries, cattle and sheep feedlots, restricted dairies, rabbits, horticulture, viticulture, hydroponics, greenhouses and glasshouses. Development applications may be required for these industries so that potential impacts on the site and on adjoining land are managed and the potential for land use conflict is diminished.

Onsite sewage management systems

Local councils in NSW are responsible for approving the type of OSMS that can be installed and ensuring that any system meets legislative requirements. An assessment will be required with a planning approval application to install an OSMS. This assessment needs to demonstrate the ability of the site to sustain an OSMS and address the property's environmental sensitivities.

Authorities may apply the 'precautionary principal' when considering the cumulative risk of adverse impacts of OSMS on water quality resulting from increased dwelling density in the catchment. This

means that if several neighbours in a drinking water catchment have an approved OSMS installed, it does not necessarily mean that more will be approved in that area.

Construction sites

Local councils require appropriate measures to be used to restrict sediment discharges from construction sites in accordance with relevant guidelines.

Land clearing: native vegetation

Land clearing is a risk to water quality, particularly when clearing occurs in close proximity to a waterway.

Before removing any trees on your land, contact your local council. The work may be assessed as 'integrated development' and require approval from other State agencies before council can approve the work. By obtaining the required approvals for tree removal, adequate assessment of work can be undertaken. This ensures the river or stream's value is protected, and the work is undertaken in an environmentally sensitive manner.

Section 3.1.2 provides a link to the NSW Environment and Heritage information about what type of clearing you can undertake with and without approval, including information about Routine Agricultural Management Activities (RAMAs) and the new self-assessable codes.

Under the *Native Vegetation Act 2003* most clearing of remnant native vegetation or protected regrowth requires landholders to seek approval for a Property Vegetation Plan (PVP) from Local Land Services.

Land clearing is a risk to water quality.

Farm planning

Effective farm planning aims to simplify farm management, improve productivity and include biodiversity and ecological issues in farm decision making. The benefits of planning are significant for the farm's business, productivity and land stewardship.

Before clearing any land on your property, always contact your local council – approvals may be required

Planning for the farm's business, productivity and land stewardship has significant benefits

There are guidelines, courses and publications to assist landholders with farm planning (refer to Section 3.1.2).

ACTIONS FOR PLANNING

- Avoid siting a house or other buildings on steep slopes, boggy land or on soils that easily erode or shift.
- For septic tank installation, check the soil type. Avoid boggy areas. Be mindful of high water tables. Situate absorption trenches away from waterways and divert storm water away from the area. Your local council will require you to meet these conditions before giving permission to proceed with an installation. Set back distances apply.
- To avoid water pollution, locate stockyards and feed areas away from waterways and dams, and ensure drainage around milking sheds and farm buildings does not run into waterways.
- Site dams away from streams. Situate them where soils and slopes are suitable. Contact your local council before building a dam.
- Locate roads in areas away from wet depressions. Sediment traps should be installed to catch sediments from any erosion.
- Maintain trees and shrubs along waterways to help prevent bank erosion.
- Minimise waterway crossings to ensure that crossings are fish friendly. Permits are required to construct waterway crossings.
- Prevent stock access, particularly calves, to waterways. Supply water for stock away from waterways.
- Cultivation can occur on slopes less than 9% (5 degree angle) if soil conditions are right. Contact your local council to check if your intended land use is allowed.
- Priority should be given to revegetating slopes that are steeper than 9% (5 degrees) and maintaining the vegetative cover.
- Slopes greater than 9% (5 degrees) should not be cultivated except to renew pasture.
- On slopes greater than 18% (10 degree angle), tree cover should be retained or established. Cultivating should be avoided and grazing restricted to maintain ground cover.
- Steep slopes above 30% (17 degree angle) are high erosion-risk zones and should be left undisturbed. These areas typically have shallow soils and increased risk of landslip.

Bushfire protection and recovery

Intense bushfires can not only cause significant damage to, or destruction of water catchments; they also leave the ground bare and vulnerable to erosion. When heavy rainfall occurs after a bushfire, many contaminants (such as ash, debris and unusually high sediment loads due to damaged vegetation alongside waterways) are washed into waterways, causing poor water quality.

Fire and Rescue NSW (FRNSW) and the Rural Fire Service (RFS) provide a vast amount of information on how to reduce fire risks on your property and offer assistance in the development of bush fire survival plans.

DPI provides information on preparedness and risk management, support, publications and advice and links to services that help in the recovery of farming businesses and communities after bushfire.

Heavy rain after a bushfire washes many contaminants into waterways.

Section 3.1.2 provides further information on farm planning and bushfire protection.
Section 3.1.8 provides further information on Waterways and adjacent land management.

2.8 Treat catchments with respect

> Wherever you are in NSW, your actions can have a potential health impact on your community's drinking water supply.

Everyone should treat catchments with respect, regardless of where they live. Remember that most waterways within NSW drain to a source used for drinking water supplies. This means that wherever you are in NSW, your actions can have a potential health impact on communities. In times of drought, when reservoir levels in water catchments are low, even more careful management of water quality and quantity is required.

Treat catchments with respect

Recreational use of water catchment areas

Many Australians enjoy the experience of getting outdoors and going bush. When pursuing recreational activities in drinking water catchment areas, you must always:

- Follow the restrictions in place to protect the water supply
- Follow signposted directions
- Remain on marked tracks, trails or roads
- Camp only in designated areas
- Take rubbish home or place in the bins provided
- Report dumped items to the authorities
- Follow restrictions placed on domestic animals; many catchment areas do not allow dogs or other domestic animals.

You should be considerate when camping and undertaking high-impact activities to reduce negative impacts on the water catchment.

If in doubt, check with the local water supply authority to find out what activities are permitted in your water catchment areas.

Check with the local water supply authority to find out what activities are permitted in your water catchment areas

Disposing of waste

> Dispose of waste properly to avoid them or their products ending up in our waterways.

Good waste management on farms is essential to protect your land and waterways from contamination. It can also save you money, prevent stock injury or death, improve the value of your property and help avoid costly clean-up. The EPA has a fact sheet available for reference on waste residue for farmers and landholders (refer to Section 3.1.7).

Do not litter or pour chemicals down drains. Rubbish thrown onto the street or in the gutter usually ends up in the stormwater system and this runoff eventually ends up in rivers and streams (waterways). This is a major source of waterway contamination.

Household rubbish

Kitchen scraps can be composted – approximately 25% of your household rubbish can be converted to fertiliser. Other household rubbish should be disposed of by a waste management contractor or at the local landfill or transfer station.

Rubbish must NOT be burnt.

The EPA has a free household chemical cleanout program. It accepts a range of domestic materials, including gas cylinders, batteries, fluorescent tubes, and chemicals, such as acids and oil paints. Refer to Section 3.1.3 for more information on safe disposal of chemicals.

Oil and used filters

Oil and used oil filters must not be disposed of on farms. Oil and oil filters can be reused or recycled by waste oil contractors: contractors in your area can be found in the Yellow Pages or online. Contact your local council for details of landfills and transfer stations that accept waste oil.

Treated timber and tyres

Treated timber contains copper chrome arsenate (CCA) or creosote; if it is not possible to reuse treated timber, it should be disposed of at a transfer station or landfill. It must not be burned as the ash can not only have adverse impacts on soil and water, but can also affect human and stock health. Ash from burnt CCA timber contains up to 10 per cent (by weight) arsenic, copper and chromium.

Waste tyres may be re-used for certain uses but they must not be burnt. If not being re-used, waste tyres should be taken to a licensed landfill for recycling or disposal.

Dead stock

Dead stock decay, and when dumped in or near waterways can pollute streams and contaminate watercourses with pathogenic microorganisms. Never bury dead stock in water supply catchment areas without first consulting with your local water utility. Dead animals should be sent to a knackery, rendering plant or to an appropriate landfill. Stock should not be burnt unless specified for disease control. See the EPA website for further information on disposing of dead stock.

For more information refer to **Section 3.1.1**, **Section 3.1.7**, and **Section 3.1.9**.

Photo Credits – Part 2

19 | *Vegetation filters and traps contaminants.*
Photo © Shannon Greenfields

Riparian vegetation stabilises riverbanks and prevents erosion.
Photo © NSW Department of Primary Industries

20 | *Choose local indigenous plants where possible. Ask your local native plant nursery for advice.*
Photo © NSW Department of Primary Industries

22 | *Protect water quality by keeping stock out of waterways.*
Photo © NSW Department of Primary Industries

Provide off stream watering points for stock.
Photo © NSW Department of Primary Industries

24 | *Maintain continuous ground cover in an orchard to prevent soil erosion.*
Photo © Rous County Council

Stabilise stream banks to prevent soil erosion.
Photo © NSW Department of Primary Industries

26 | *Use and manage fertilisers wisely to reduce nutrient runoff into waterways.*
Photo © Rous County Council

27 | *Parasitic wasp eggs used as an alternative to chemicals for combating pests in a macadamia orchard.*
Photo © Rous County Council

28 | *Targeted application of chemicals reduces risk to waterways, plants or stock.*
Photo © NSW Department of Primary Industries

29 | *Proper planning and development of land helps protect the environment and maintain land value.*
Photo © Rous County Council

31 | *Before clearing any land on your property, always contact your local council – approvals may be required.*
Photo © NSW Department of Primary Industries

Planning for the farm's business, productivity and land stewardship has significant benefits.
Photo © NSW Department of Primary Industries

33 | *Treat catchments with respect.*
Photo © NSW Department of Primary Industries

Check with the local water supply authority to find out what activities are permitted in your water catchment areas.
Photo © NSW Department of Primary Industries

From the source... to the glass.
It's a shared responsibility.

Photo © NSW Department of Primary Industries

PART 3

Further information, resources and contacts

For specific information or assistance on controlling hazards in drinking water catchments, contact your local water supplier, Landcare or Local Land Services.

Financial assistance may be available for fencing, the creation and maintenance of vegetated land alongside waterways, and the installation of off-stream watering points. Assistance may also be available for training and education.

Part 3 Further information, resources and contacts is broken into three sections:

Section 3.1

Further information and resources contains a wide range of resources that may help you with many aspects of protecting private property within water catchments.

Section 3.2

Interactive maps provides details on useful online interactive maps.

Section 3.3

Key contacts lists several organisations that may be able to assist you with managing your land effectively.

Section 3.1 contains the following:

3.1 Further information and resources

3.1.1 Key guidelines, codes of practice and legal responsibilities

- *Rural Landholders Guide to Environmental Law in NSW*, Environmental Defenders Office (2008).

The purpose of this booklet is to help you understand your legal rights and obligations as a landholder and to manage your land in accordance with environmental and natural resource management law.

Environmental Defenders Office
www.edo.nsw.org.au

Free Call: 1800 626 239
Telephone: (02) 9262 6989 *Head Office*

- *The Bush Law Handbook*, T Smith (2005). ISBN 0947205861. Published by Redfern Legal Centre Publishing.

The Bush Law Handbook gives detailed information in plain English about the laws that relate to farmers and rural communities. The book includes practical tips on subjects like accessing drought relief assistance, and dealing with Centrelink and Native Title claims. The new edition updates the law since the first edition in 1998.

Available from most bookshops.

- Department of Primary Industries legislation information.

NSW Acts and Legislation administered by the Minister for Primary Industries. Topics include animals and livestock, general farming, water, pests and weeds.

Department of Primary Industries
www.dpi.nsw.gov.au

Telephone: (02) 6391 3100 *Head Office*

- *Water Made Clear – A consumer guide to accompany the "Australian Drinking Water Guidelines 2004"*, Australian Government (2004).

This publication from the National Health and Medical Research Council provides an easy to read overview of the processes required for the provision of safe drinking water for the community.

National Health and Medical Research Council
www.nhmrc.gov.au

Free Call: 1300 064 672
Telephone: (02) 6217 9000

Photo © NSW Department of Primary Industries

3.1.2 Farm planning

Whole Farm Planning is a process of planning, property design and management based on natural resources and economic factors. The Plan develops short and long-term goals based on the aims of the farming family or operation. The Plan aims to simplify management, improve productivity and include biodiversity and ecological issues in farm decision making. It takes into account livelihood, lifestyle and landscape to ensure sustainability of all three. The Plan should include a continuous process of 'plan, do, check and review'.

The Plan can address objectives at the property, industry, landscape, catchment/regional, state and national scales. It can include issues such as:

- **Identifying assets and threats**
- **Risk management**
- **Increasing the profitability of the business**
- **Demonstrating sustainability and environmental stewardships (such as Environmental Management Systems)**
- **Applying Best Management Practice programs.**

For more information on:

- Whole Farm Planning courses – to complete a Farm Plan with a preferred provider – contact:
  - DPI
  - TAFE
  - Landcare
- Completing a Farm Plan using self-assessment guidelines, enquire with DPI for programs such as Environmental Best Management Practice (EBMP).
- Getting a Farm Plan prepared by a farm planning service provider, contact the DPI Farm
- Planning Officer in your region, or check the telephone directory for registered farm consultants.

• *Living and Working in Rural Areas – A handbook for managing land use conflict issues on the NSW North Coast*, Centre for Coastal Agricultural Landscapes & NRCMA (2007). ISBN 978 0 646 48527 0. Published by the NSW DPI, Wollongbar. Chapter Six – Development Control outlines core environmental planning instruments, principals to guide development, land use buffers, land use conflict and resources and contacts.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*
• Tocal Books Tocal books are high quality, accurate and reliable references on all aspects of agriculture and land management.	**www.tocal.nsw.edu.au/publications** Free Call: 1800 025 520
• DPI's Property Management Planning (PMP) for Natural Resource Management – PROfarm course. PROfarm courses are delivered locally by highly skilled and respected NSW DPI staff. This is a course designed for land managers and farm families interested in natural resource management for sustainable farm production.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*

3.1.2 Farm planning

• Dairy Self-Assessment Tool (SAT). The Dairy Self-Assessment Tool (Dairy SAT) is a useful online self-assessment and action-planning tool for Australian Dairy Farmers to understand the environmental issues facing dairy farming; benchmark on-farm environmental management practices with industry best practice; identify critical environmental management practices on farms; develop action plans; and access further information to understand environmental issues and improve practices on farm.	**www.dairysat.com.au** Telephone: (03) 9694 3848
• *Introduction to Environmental Management Systems in Agriculture – Biodiversity Resource Guide (New South Wales)*, Department of Agriculture (2002). The Biodiversity Resource Guide contains: the main national and state level legislative requirements and policy objectives that are relevant to landholders; a listing of available biodiversity resources, information, support services and contacts; a listing of sectoral and policy Codes of Practice; and best management practice guidelines relevant to landholders and biodiversity.	**www.daff.gov.au** Free Call: 1800 900 090
• Native Vegetation Regulation 2013 Provides links to information for landholders on the Native Vegetation Act 2003 and the Native Vegetation Regulation 2013. Contains information regarding what clearing you can undertake without approval, including information about routine agricultural management activities (RAMAs) and the new self-assessable codes.	**www.environment.nsw.gov.au** Telephone: 131 555
• CSIRO Publishing CSIRO's publications on farm planning, farm management and systems, Landcare, pest and weed control, crops and pastures.	**www.publish.csiro.au** Free Call: 1300 788 000 Telephone: (03) 9545 8400
• TAFE short courses New landowners and lifestyle farmers can seek information on TAFE courses relevant to their land management activities.	**www.tafe.nsw.edu.au** Telephone: 131 601
• DPI Information: Preparing for and responding to bushfires in rural areas.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*
• The Rural Fire Service: Information about risk management planning, bush fire survival plan and preparing your property for a bush fire.	**www.rfs.nsw.gov.au** Telephone: (02) 8741 5555

3.1.3 Chemical use (including fertilisers)

• *Reducing Herbicide Spray Drift*, NSW Agriculture (2004). Agnote fact sheet on herbicide use and reducing drift.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*
• EPA Information: Chemicals and pesticides Useful information on appropriate management of pesticides, legislation governing pesticide use, record keeping, training and notification requirements and pesticide control orders governing the use of restricted chemical products.	**www.epa.nsw.gov.au** Telephone: 131 555
• DPI Information: Farm chemicals Information on the use of farm chemicals on the DPI website.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*

3.1.4 Vegetation

• LLS Information: Native vegetation LLS provide extension, advisory and property vegetation plan services. They may also be able to help with financial assistance to manage or increase existing native vegetation on your property.	**ww.lls.nsw.gov.au** Telephone: 1300 795 299
• *Australia's Native Vegetation Framework*, Standing Council on Environment & Water, Australian Government, Department of Sustainability, Environment, Water, Population and Communities, Canberra (2012). The national framework to guide the ecologically sustainable management of Australia's native vegetation.	**www.scew.gov.au**
• OEH Information: Native vegetation for landholders Information on what clearing you can undertake without approval, including information about routine agricultural management activities (RAMAs) and the new self-assessable codes on when a Property Vegetation Plan (PVP) is required, including how to develop and vary a PVP.	**www.environment.nsw.gov.au** Telephone: 131 555

3.1.5 Soil erosion

• *Saving Soil – A landholder's guide to preventing and repairing soil erosion*, NSW Department of Primary Industries (2009). A resource providing the landholder with an understanding of: techniques to prevent and remedy erosion, how to apply these techniques to the landscape and soil type, integrating erosion control in routine land management, fixing minor erosion problems, seeking technical expertise and knowing what to ask experts.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*

3.1.5 Soil erosion

- DPI Soil Erosion Solutions: *Helping North Coast Landholders Reduce Soil Erosion:* Fact Sheets 1-7

1. Types of erosion 2. Indicators of erosion 3. Monitoring erosion
4. Groundcover 5. Gully Erosion 6. Roads and Tracks
7. Planning your erosion project

www.dpi.nsw.gov.au
Telephone: (02) 6391 3100 *Head Office*

- DPI AGFACTS: *Cover-crops for Subtropical Orchards*, NSW Agriculture (2003).

www.dpi.nsw.gov.au
Telephone: (02) 6391 3100 *Head Office*

3.1.6 Onsite sewage management systems

- *Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households*, Office of Local Government (1998).

Provides information on regulation, on-site sewage management strategies, operational strategies, site evaluation, system options and selection, and a resource section.

www.olg.gov.au
Telephone: (02) 4428 4100

- *The Easy Septic Guide*, NSW Department of Local Government (2000).

A booklet for anyone in NSW with a home not connected to the sewer. Illustrates how to manage a septic system safely.

www.olg.gov.au
Telephone: (02) 4428 4100

3.1.7 Farm waste

- DPI Information: Agricultural recycling and waste management.

Provides information on regulation, on-site sewage management strategies, operational strategies, site evaluation, system options and selection, and a resource section.

www.dpi.nsw.gov.au
Telephone: (02) 6391 3100 *Head Office*

- EPA's 'Cleanout Program'

A FREE service for the safe disposal of a range of common household chemicals which could cause harm to human health and the environment if not disposed of correctly.

www.epa.nsw.gov.au
Telephone: 131 555

3.1.8 Waterways and adjacent land management

- *Stock and waterways: A Manager's Guide*, Land and Water Australia (LWA) (2006).

www.arrc.com.au

- *Protect our Waters, Protect our Health: Highlighting the importance of preventing stock access to waterways*, Department of Health (2011).

www.health.vic.gov.au
Telephone: 1300 650 172

3.1.8 Waterways and adjacent land management

• LWA River and Riparian Management Series: Fact Sheets 1–13 1. Managing riparian land 2. Stream bank stability 3. Improving water quality 4. Maintaining in-stream life 5. Riparian habitat for wildlife 6. Managing stock 7. Managing woody debris in rivers 8. Inland rivers and floodplains 9. Planning for river restoration 10. River flows and blue-green algae 11. Managing phosphorous in catchments 12. Riparian ecosystem services 13. Managing riparian widths	**www.arrc.com.au**
• Threat abatement plan - Removal of large woody debris from NSW rivers and streams (2007). The 'removal of large woody debris from NSW rivers and streams' is listed as a key threatening process under the NSW Fisheries Management Act 1994. Large woody debris includes trees, trunks, branches, tree heads or root masses that have fallen, been washed or placed into rivers or streams, and were previously referred to as "snags".	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*
• DPI Fisheries and Aquaculture Information: Council and Developer Toolkit Information and links for permits when managing aquatic habitats for dredging and reclamation, blocking fish passage, harming marine vegetation or using explosives in a waterway.	**www.dpi.nsw.gov.au** Telephone: (02) 6391 3100 *Head Office*
• Controlled Activity Approvals Information the laws around living and working on a riverbank including Controlled Activity Approvals and Riparian Corridor Guidelines.	**www.water.nsw.gov.au** Telephone: 1300 353 104

3.1.9 Other Guides

• *A Consumer's Guide to Drinking Water*, Cooperative Research Centre for Water Quality and Treatment – Australia's national drinking water research centre (2006). This consumer's guide to drinking water outlines all aspects of drinking water - from the catchment to the tap.	**www.waterra.com.au** Telephone: (08) 7424 2445
• Town and Country Farmer Magazine	**www.tacfarmer.com.au**
• Landcare in Focus Magazine	**www.landcareonline.com** Telephone: 1800 151 105

3.2 Interactive maps

Spatial Information Exchange

The SIX Portal **www.six.nsw.gov.au** is the official source of NSW geospatial information. It also provides access to authoritative land and property information. Six Maps **www.maps.six.nsw.gov.au** is a useful tool providing cadastral and topographic information, satellite data and aerial photography. Select base maps on the right-hand side and NSW Imagery or NSW Base Map. You can then type in your property address or use the map of NSW to select your area and zoom down to a particular property.

3.3 Key contacts

Apiarists' Association (NSW)

The NSWAA is the state peak body for commercial beekeepers. There are several Branches of NSWAA and many of these run events and meetings in their regions.

Address: **PO Box 833, Mudgee, NSW 2850**
Email: **info@nswaa.com.au**
Website: **www.nswaa.com.au**

Aquaculture Association, NSW

Peak industry body that represents the landbased aquaculture industry in NSW. Includes membership, information, and field days.

Address: **PO Box 3, Karuah, NSW 2324.**
Email: **rob@nswaqua.com.au**
Web site: **www.nswaqua.com.au**

Australian Banana Growers Council

Peak body that represents the Australian banana industry. Includes membership, information and events.

Address: **PO Box 309, Brisbane Market, QLD 4106**
Phone: **(07) 3278 4786**
Email: **info@abgc.org.au**
Website: **www.abgc.org.au**

Australian Government Department of Agriculture and Water Resources

Responsible for agriculture, fisheries and forestry at the national level. Provides an internet portal to government information at local, state and commonwealth levels. Agricultural natural resource management, industries, products and agribusiness.

Address: **GPO Box 858, Canberra, ACT 2601**
Phone: **1800 900 090**
Website: **www.agriculture.gov.au**

Australian Government – Department of the Environment

Department of the Environment designs and implements the Australian Government's policies and programmes to protect and conserve the environment, water and heritage and promote climate action.

Address: **GPO Box 787, Canberra, ACT 2601**
Phone: **1800 803 772**
Website: **www.environment.gov.au**

Australian Macadamia Society

Peak macadamia industry body. Provides statistics, grower guides, contacts, fact sheets, and other information.

Address: **113 Dawson St, Lismore NSW 2480**
Phone: **(02) 6622 4933**
Email: **office@macadamias.org**
Website: **www.macadamias.org**

Australian Pecan Growers Association Inc.

A membership group offering information to its members relating to all aspects of pecan supplies, farming, processing and marketing.

Address: **PO Box 590, Lismore NSW 2480**
Phone: **(02) 6564 8747**
Email: **info@pecangrowers.org.au**
Website: **www.pecangrowers.org.au**

Australian Pork Ltd

National representative body for Australian pig producers. Includes marketing, research, fact sheets, events and seasonal updates.

Address: **PO Box 4746, Kingston ACT 2604**
Phone: **1800 789 099**
Email: **apl@australianpork.com.au**
Website: **www.australianpork.com.au**

Australian Tea Tree Industry Association

Peak body of the Australian tea tree growing industry. Includes research, membership and news.

Address: **PO Box 903, Casino NSW 2470**
Phone: **(02) 4017 1336**
Email: **secretary@attia.org.au**
Website: **www.teatree.org.au**

Avocados Australia

Peak industry body in Australia. Includes marketing, research, fact sheets, events and seasonal updates.

Address: **Po Box 8005, Woolloongabba QLD 4102**
Phone: **(07) 3846 6566**
Email: **admin@avocado.org.au**
Website: **www.industry.avocado.org.au**

Biodynamic Agriculture Australia

A not-for-profit producer-based organization that promotes biodynamic agriculture.

Address: **PO Box 54, Bellingen NSW 2454**
Phone: **(02) 6655 0566.**
Email: **bdoffice@biodynamics.net.au**
Website: **www.biodynamics.net.au**

Citrus Australia

Peak body of the Australian citrus growing industry. Includes membership, research, fact sheets, events and seasonal updates.

Address: **PO Box 10336, Mildura VIC 3502**
Phone: **(03) 5023 6333**
Email: **admin@citrusaustralia.com.au**
Website: **www.citrusaustralia.com.au**

Department of Primary Industries (NSW Government)

Coordinates the Agriculture, Fisheries, Food Authority, Biosecurity, NSW Office of Water and Land and Natural Resources.

Address: **Locked Bag 21, Orange NSW 2800**
Phone: **(02) 6391 3100**
Website: **www.dpi.nsw.gov.au**

Farmers Association (NSW)

A voluntary industry body representing the farming community. Contact for information on farmer education and training, matters affecting rural industries, industrial relations, rural issues and local agricultural events

Address: **PO Box 459, St Leonards NSW 1590**
Phone: **(02) 9478 1000**
Email: **emailus@nswfarmers.org.au**
Website: **www.nswfarmers.org.au**

Greening Australia

Provides trees and tree planting services, technical advice and education, volunteer, coordination and funding for restoration projects.

Address: **333 Bennets Rd, Norman Park, QLD 4170**
Phone: **1300 886 589**
Email: **general@greeningaustralia.org.au**
Website: **www.greeningaustralia.org.au**

Land and Property Information (NSW Government)

Provides land title registration, property information, valuation, surveying and mapping, and map sales.

Address: **GPO Box 15, Sydney NSW 2001**
Phone: **1300 052 637**
Email: **generalenquiry@lpi.nsw.gov.au**
Website: **www.lpi.nsw.gov.au**

Landcare

A nationwide program which facilitates community and volunteer activities in natural resource management.

Address: **PO Box 2069, Armidale NSW 2350**
Website: **www.landcarensw.org.au**

Local Land Services (NSW Government)

Delivers quality, customer-focused services to farmers, landholders and the community across rural and regional New South Wales in the areas of agricultural production advice, biosecurity, natural resource management and emergency management.

Phone: **1300 795 299**
Website: **www.lls.nsw.gov.au**

National Parks and Wildlife Service (NSW Government)

Responsible for maintaining the parks and reserve system, and conserving natural and cultural heritage in NSW. Contact for information on native plants, animals and habitats; their identification, management, regulations and licensing requirements. They also offer a number of incentive schemes for Landholders interested in nature conservation. Cultural Heritage Officers can assist with identifying whether your land harbours places of importance to Aboriginal people and how you can manage them best.

Phone: **1300 072 757**
Email: **info@environment.nsw.gov.au**
Website: **www.nationalparks.nsw.gov.au**

NSW – Environment Protection Authority

Responsible for administering the Protection of the Environment Operations Act 1997. Contact for information on the regulations regarding pesticide usage (Pesticides Act 1999) and air, water, land or noise pollution.

Address: **PO Box A290, Sydney South NSW 1232**
Phone: **131 555**
Email: **info@environment.nsw.gov.au**
Website: **www.epa.nsw.gov.au**

NSW – Environmental Defender's Office

A not-for-profit community legal service specialising in public interest law, assisting individuals and community groups working to protect the natural and built environment. Provides easy to read fact sheets and other publications on environmental.

Address: **Level 5, 263 Clarence Street, Sydney NSW 2000**
Phone: **1800 626 239**
Email: **edonsw@edonsw.org.au**
Website: **www.edonsw.org.au**

NSW Government Online Shop

For purchasing of publications, DVDs and other products. Subject areas include environment, agriculture and fisheries, and resources.

Email: **shop.nsw@finance.nsw.gov.au**
Website: **www.shop.nsw.gov.au**

NSW Legislation (NSW Government)

Lists all government legislation.

Address: **GPO Box 4191, Sydney NSW 2001**
Phone: **(02) 9321 3333**
Website: **www.legislation.nsw.gov.au**

NSW Trade and Investment – Crown Lands (NSW Government)

Provides information on crown lands, which it administers and manages under the Crown Lands Act.

Address: **PO Box 2185, Dangar NSW 2309**
Phone: **1300 886 235**
Email: **enquiries@crownland.nsw.gov.au**
Website: **www.crownland.nsw.gov.au**

Office of Environment and Heritage (NSW Government)

Provides information on environmental issues, conservation, culture and heritage and National Parks and Wildlife.

Address: **Po Box A290, Sydney South NSW 1232**
Phone: **(02) 9995 5000**
Email: **info@environment.nsw.gov.au**
Website: **www.environment.nsw.gov.au**

Office of Local Government (NSW Government)

Contact about rates, roads, bridges, waste, community services, water and sewage services, flood mitigation, noxious weeds, tree clearing, acid sulphate soils and all development applications. Listed in local phone books or Local Government Directory.

Address: **Locked Bag 3015, Nowra NSW 2541**
Phone: **(02) 4428 4100**
Email: **olg@olg.nsw.gov.au**
Website: **www.olg.nsw.gov.au**

DPI – Water (NSW Government – Department of Primary Industries)

For all information regarding water management. Farm dams, licensing, irrigation, water sharing plans, river bank works – approvals.

Address: **GPO Box 3889, Sydney NSW 2001**
Phone: **(02) 8281 7777**
Email: **water.enquiries@dpi.nsw.gov.au**
Web: **www.water.nsw.gov.au**

Organic Federation of Australia

Peak body for the organic industry in Australia.

Address: **2 School Road, Tamborine Mountain, QLD, 4272.**
Email: **admin@ofa.org.au**
Website: **www.ofa.org.au**

Rural Assistance Authority (NSW Government)

Responsible for administering assistance measures to rural producers and small businesses on behalf of the Commonwealth and State Governments.

Address: **Locked Bag 23, Orange NSW 2800**
Phone: **1800 678 593**
Email: **rural.assist@raa.nsw.gov.au**
Website: **www.raa.nsw.gov.au**

Rural Fire Service (NSW Government)

Responsible for fire suppression and prevention in rural NSW. Contact for all information about fires - management, emergencies and training in firefighting.

Phone: **(02) 8741 5555**
Website: **www.rfs.nsw.gov.au**

Rural Industries Research and Development Corporation (Australian Government)

A government organization that is responsible for funding research on, and helping develop, rural industries. They supply a range of reports, newsletters and other publications on new and established rural industries.

Address: **PO Box 4776, Kingston ACT 2604**
Phone: **(02) 6271 4100**
Email: **rirdc@rirdc.gov.au.**
Website: **www.rirdc.gov.au**

State Emergency Service (NSW) – SES

A volunteer emergency and rescue service that is the lead response agency for floods and storms across NSW. Contact when requiring assistance for storms and floods and about preparing for them.

Address: **PO Box 6126, Wollongong NSW 2500**
Phone: **Emergencies 132 500 / volunteering and safety information 1800 201 000**
Website: **www.ses.nsw.gov.au**

TAFE NSW (NSW Government)

Provides training in computing, accounting, agriculture, aquaculture, environmental studies, horticulture, and horse management.

Website: **www.tafensw.edu.au**

Tocal College (NSW Government – Department of Primary Industries)

Contact for agricultural training courses.

Address: **Tocal College, Paterson NSW 2421**
Phone: **1800 025 520**
Email: **tocal.college@dpi.nsw.gov.au**
Website: **www.tocal.nsw.edu.au**

United Campus Bookshops

Offers a range of publications on vegetation identification and natural resource management.

Address: **Union Complex, University of New England, Armidale, NSW 2351.**
Phone: **(02) 6772 3468**
Email: **armidale@ucb.net.au**
Web site: **www.ucb.net.au**

WIRES – NSW Wildlife Information, Rescue and Information Service Inc

Provides wildlife rescue and care from 27 branches across the state.

Head Office
Address: **PO Box 260, Forestville NSW 2087**
Phone: **(02) 8977 3333**
NSW WIRES rescue line 1300 094 737
Email: **info@wires.org.au**
Website: **www.wires.org.au**

WorkCover NSW

A statutory body, whose purpose is to achieve safe work places (including farms). Contact for information about how to manage safety risks, WHS training and legal obligations as an employer.

Phone: **131 050**
Email: **contact@workcover.nsw.gov.au**
Website: **www.workcover.nsw.gov.au**

HEALTHY CATCHMENTS HEALTHY WATER

Managing land within drinking water catchments: A practical guide for NSW landholders

The Healthy Catchments, Healthy Water land management guide explains the important things to consider when managing land in a water catchment.

It provides a starting point in understanding the various contaminants that can enter waterways as a result of agricultural activities and development, the sources of these contaminants and how they can be controlled by landholders. The guide provides information on a variety of management practices that can be adopted by all NSW landholders to protect drinking water supplies.

It will help you care for your land, the health of waterways, your local drinking water supply, wildlife and people.

Presented by

ROUS COUNTY COUNCIL

WATER DIRECTORATE