



B IODIVERSITY MANAGEMENT





Section 3: Biodiversity Management

The Expected Environmental Outcome for Biodiversity states

All reasonable and practicable measures should be adopted, within the constraints of a sustainable agricultural system, to conserve representative native species and ecosystems (QFF 1998).

To conserve biodiversity, both species and habitat diversity need to be maintained. This is due to a strong interdependent link between degraded habitats and loss of fauna.

Issues arising with biodiversity management will differ from district to district and farm to farm. Even on one farm, a range of ecosystem types (eg: wetland areas, riparian vegetation, regrowth forest, floodplains) may exist, each with different management requirements.

Growers can find more local information on flora and fauna species and ecosystem types from their local QDoE office. Information on endangered ecosystems and 'threatened' species in Queensland can also be provided.

'Threatened' species are those that are presumed extinct, endangered or vulnerable (QDoE 1998a). A damage mitigation permit cannot be obtained for 'threatened' animal species.

Other sources of helpful information include local Landcare groups or Integrated Catchment Management groups.

3.1 MANAGE VEGETATION ON FARM

Conservation of representative samples of native ecosystems can be a part of the whole farm planning process. Planning ahead allows biodiversity to be retained alongside farm development.

About 13% of Queensland's native plant species are rare or threatened (QDoE 1998a). 21 plants are presumed extinct, 81 species are endangered, 243 are vulnerable and 693 are rare (QDoE 1998a).

Growers should consider the retention of self-sustaining corridors and pockets of vegetation along rivers and creeks, gullies and on steep slopes. Greater areas of remnant vegetation will help maintain native animals and plants, by providing a transport corridor to link habitat areas.

Pockets of vegetation on the farm can provide benefits for the grower. They function as buffers between different land uses (see section 4.2), as windbreaks and can help with rehabilitation and reclamation of degraded areas. Deep-rooted vegetation can help keep water tables lowered and help recycle nutrients within the ecosystem.

Woody and noxious weeds may spread across farmland; choking vegetation in wetlands, on stream-banks and invading open spaces. Direct action needs to be taken against invasive weed pests to keep them in check.

3.1.1 Plan for vegetation retention where possible

3.1.2 If tree clearing, do so with due consideration

3.1.3 Manage introduced plants



Remnant vegetation has been maintained along the creek at the bottom of this photograph. Planted trees along the perimeter of the orchard (centre) act as windbreaks and wildlife corridors.





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3.1.1 Plan for vegetation retention where possible

It is more difficult to establish native vegetation where extensive clearing has traditionally occurred. Forward planning will ensure that any new farm development is integrated with native vegetation.

Planning involves knowing what vegetation already exists and where it is found. An aerial map can be used to identify vegetation types and their extent.

The history and biology of local remnant vegetation will help decide what species to use if revegetation or enrichment planting is carried out. The regional QDoE office has information on species that are useful for a given area.

Re-vegetation can be encouraged with direct seeding (Tree Note B3), or using seeds or vegetative parts of mature trees, shrubs and other native plants.

Example:

Community Rainforest Reforestation Program (CRRP)

The CRRP in north Queensland is a specific program to encourage farm forestry. The main focus of the program is the planting and growth of plantation grown rainforest timber to supplement the growing demand for rainforest timber products (QDPI 1997).

This allows some areas that may be degraded or under-utilised to generate an income and contribute to employment opportunities. Plantings are mapped out using geographic information systems on an area and species basis. Over a 4-year period, 500 landholders have become involved covering approximately 1600 hectares of land in rainforest trees for future use (QDPI 1997).

Fencing off areas, light cultivation, and burning or scarifying will help promote natural seed germination.

Consider planting new seedlings (enrichment planting) in existing stands of vegetation where understorey has been degraded or lost. This helps reverse the impacts of clearing and habitat disturbance on wildlife and waterways.

Enrichment planting focuses on increasing species diversity, the number of a given species or the commercial species in particular.

3.1.2 If tree clearing, do so with due consideration

Where vegetation is to be cleared, leave areas that are of a reasonable size and interconnected, to allow viable ecosystems. This is especially important next to watercourses.

If clearing needs to take place, take into account the slope steepness and what effect clearing ridges may have if salinity is a problem in the area (Tree Note B21).

There are some legislative barriers to clearing. Growers should consult with their local government authority about local tree-clearing on free-hold land.

Conditions to clearing may arise from Local Government administered Vegetation Protection Orders and Conservation Plans under the Nature Conservation Act 1992 or for areas, which have been designated a 'critical habitat'. Clearing is not permitted in areas designated as endangered ecosystems.

State Tree Clearing Guidelines apply on Crown Land. Provisions of the Water Resources Act 1989, and Riverine Environment Protection Guidelines apply to any proposed clearing within the bed and banks of a watercourse.

3.1.3 Manage introduced plants

Introduced plants now account for 15% of the total flora (Lowe 1996). A quarter of them have the potential to be serious environmental weeds, including rubbervine, para grass, giant sensitive plant, 2 semi-aquatic grasses, blue thunbergia and athel pine (Lowe 1996).

Weeds are estimated to cost Australia about \$3.3 billion annually. Of the 1900 plants that have become naturalised, 220 are declared noxious weeds (Lowe 1996).





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Descriptions of Queensland's major weed pests and management options for their control can be obtained from the QDNR.

3.2 MANAGE NATIVE ANIMALS ON FARM

The status of Queensland's vertebrate animals and butterflies (excluding most fish) was reviewed by the QDoE in 1997 to determine which species were threatened (QDoE 1998b).

Currently, 132 animal species are considered threatened in Queensland with another 151 species considered rare (QDoE 1998b).

Reasons for decline include habitat change; competition from domestic grazing animals and predation by introduced animals such as foxes and cats (QDoE 1998b).

3.2.1 Managing problem native animals on-farm

Where growers are faced with 'problem' native animals, specialised forms of management and control are needed.

Native animals can be a problem to a wide variety of crops including tree crops (particularly lychees, longans, exotic tropicals and mangoes), bananas, pineapples, grapes and berry crops.

Examples include flying foxes and birds (rainbow and scaly breasted lorikeets, king parrots, rosellas and currawongs). Possums, wallabies and kangaroos can damage vegetables, strawberries and melons, while mice, rats and birds can leave holes in fruit.

The impact of native animals on production is variable due to changes in pest composition and population size. When numbers of a problem animal build rapidly attacks can be severe, causing a large economic loss to an individual grower. Even minor problem animals can cause significant sporadic damage.

The potential for damage can't be easily predicted from year to year. There are several factors that influence the extent of damage. These include the closeness of farms to populations of a problem animal, (eg: flying fox camps), availability of other food sources for problem animals and the effect of weather on food sources (eg: drought may prevent eucalypt flowering).

Options for problem animal management vary greatly in their reliability and effectiveness. Often the best results are found where a combination of methods exist.

Some assessment of the merits of each can be found in the articles, "Controlling pest losses - Why? How? How much?" (Campbell and Greer 1994) and "Management of Birds and Flying Foxes - An Overview of Present and Future Options" (Turner 1994).

3.2.2 Use non-lethal management options for native animal control where possible.

■ Consider netting as a useful management tool.

Netting helps reduce losses particularly against birds, bats (and also fruit piercing moth for some crops). Different ways of using netting include whole field netting, row netting or individual tree netting (Campbell and Greer 1994).



Proximity to flying fox camps and availability of native food source can influence the extent of damage to fruit crops from flying fox.



Many native birds such as Rainbow Lorikeets are known to cause excessive damage to many fruit and vegetable crops.





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Netting can help reduce crop damage from birds and flying fox.

Some tree crop growers find netting on it's own provides comprehensive management of birds or bats.

For others with large orchards or trees prone to irregular fruiting, the up-front cost of netting can be expensive and more difficult to recoup in the short term.

Some areas of Queensland are more susceptible to cyclones or hail-storms that may damage nets and their infrastructure.

■ Consider other non-lethal options

Repellents / deterrents are sound and / or light based systems that seek to scare native animals through visual annoyance or simulated predatory birdcalls or distress calls of the pest species.

Other deterrents tried with bird pests (eg: Magpie geese, ducks) include sirens and gas cannons.

These options have not been shown to give 100% control but do appear to have some effect. It is important that they are used to make the orchard or crop an unattractive place before the fruit or crop start to ripen and become attractive to pests (Campbell and Greer 1994) (Turner 1994).

In general, birds and bats become quickly habituated to these sorts of devices and will learn to ignore them within a few hours to a few days (Turner 1994). Best results have been obtained where a life-threatening activity (such as shooting) is carried out concurrently with the device (Turner 1994).

3.2.3 Lethal management options and damage mitigation permits

■ Non-lethal harassment of native wildlife may be an option

If protected wildlife is damaging or threatening a crop, growers may lawfully harass wildlife so long as it is not harmed by this action. For example, if flying foxes are eating a grower's mangoes, the grower (if licensed under the Queensland Weapons Act 1990) may lawfully use a firearm to frighten away flying foxes so long as the grower does not harm any of the wildlife.

■ Get a permit when lethal control options are needed

Should a grower seek to destroy or harm protected wildlife, a Damage Mitigation Permit must first be obtained under Section 112 of the Nature Conservation Regulation 1994.

The Nature Conservation Act 1992 and the Nature Conservation (Wildlife) Regulation 1994, recognise all native vertebrates as protected animals.

Lethal control options include the use of overhead or vertical electric wires and shooting. Stone fruit growers have tried the use of an overhead grid of wires for bird and flying fox control, while some lychee growers have used vertical electrical wires across the flight path of flying foxes.

Shooting requires a permit and does not always prevent serious losses occurring. The aim is to get the scouts of flying foxes or birds before they return to the flock. This may not be an adequate means of control where food scarcity is forcing the birds and flying foxes to move into commercial orchards.

The variability of native pest problems requires them to be addressed on a case by case basis. Native animal species have been sorted into three categories to





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assist officers of the QDoE in assessing the requirements for issuing a permit.

Category 1 includes common species that are widespread and abundant in Queensland and for which Damage Mitigation Permits are routinely granted

Category 2 includes common species that inflict infrequent, minor damage to crops and do not occur in large numbers. Growers are strongly encouraged to employ non-lethal crop protection measures for species included in this category

Category 3 includes those species presumed extinct, endangered, vulnerable and rare. Under no circumstance will Damage Mitigation permits be issued for these species.

The nearest office of the QDoE will issue a Damage Mitigation Permit free of charge if the Department is satisfied that:

- Birds or bats are likely to cause significant economic loss
- The removal of individuals is not likely to cause a significant threat to that species
- Alternative methods (to shooting) have been considered
- The taking of animals will be carried out in a humane manner
- The person shooting is a registered gun owner

☞ Rapid access to a permit can be obtained in an emergency

In desperate situations the QDoE may give approval over the phone for Category 1 species. However, a completed permit application form is preferred.

The necessary permit application forms must be completed and forwarded (they can be faxed) to the QDoE as soon as possible. Growers are strongly encouraged to have a permit application on hand so that in urgent situations the form can be completed and sent to the QDoE.

☞ Permits are not being phased out

The QDoE will continue to give access to damage mitigation permits, provided that the existing conditions for granting such permits are adhered to.

However, they would like to see a phase down not a phase out of Damage Mitigation Permits, as alternative protection measures become available. Growers are encouraged to experiment with alternative strategies to deter native animals and access industry assistance schemes for implementing alternative control strategies.

3.3 MANAGE FERAL ANIMALS ON FARM

There are at least 18 exotic mammals in Australia which have developed feral populations, including cats, dogs, foxes, rabbits, pigs, water buffalo, donkeys, goats, camels and horses (Lowe 1996). Cats and foxes have been particularly associated with the decline and extinction of several native animals.

Australia's feral animals have few natural predators and some have high reproductive rates. Not only do many prey on native animals; they also compete for space, food and shelter (Environment Australia 1996).





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They may also harm vegetation through constant walking, digging or wallowing in an area or contribute to soil erosion (those with hard hooves).

Conventional methods of control include fencing, trapping, poisoning and shooting (Environment Australia 1996). Traps include cage and soft-catch traps as well as yards around water holes. This will not always work especially with those animals that are trap shy.

Poisoning usually occurs with foxes, pigs and rabbits often by the use of the bait 1080 mixed with meat, oats or carrot, layed out in a prepared pellet form. Baits may be buried or dyed to prevent non-target species eating them. For further information on feral animal control in Queensland, contact the QDNR.

