



# **DRAFT SHIRE OF DENMARK NOISE**

## **MANAGEMENT PLAN**

### **For use of Gas Guns within the Shire of Denmark**

#### **1. Introduction**

The purpose of this Noise Management Plan is to set out acceptable procedures for scaring black cockatoos and other birds which minimises disruption to nearby residents by acoustic bird scaring devices.

This Noise Management Plan has been prepared based on best practice principles derived from known guidelines and/or local laws in place in Western Australia and other parts of Australia where orchards and residential areas are in close proximity.

This Noise Management Plan applies to areas such as Town Sites, Special Residential, Special Rural and specifically tourist zoned land and smaller rural zoned lots within the Shire where property owners have strong residential amenity expectations and there is a greater likelihood of the interface of commercial agricultural pursuits leading land use conflict.

Council has discretion in the enforcement of the *Environmental Protection (Noise) Regulations 1997* (the Regulations) and is prepared to accommodate "exceedences" of the Regulations if orchardists are committed to minimising the noise impact to nearby residents by complying with this Noise Management Plan.

#### **2. Protected Bird Species**

Current and prospective orchardists should note that nothing in this policy should be taken as giving orchardists and their staff or guests licence or authority to deal with protected birds in ways that are contrary to Department of Environmentl & Conservation Guidelines. It is recommended that orchardists contact that Department directly as to the current status of bird species that are entering their property.

### **3. Definitions**

**“Another property”** means a property other than the property on which the gas gun is located and which is occupied by a person or persons other than the person who is using or who is allowing or authorising the use of a gas gun;

**“Nearby house”** means a house or holiday unit on a nearby property (“another property”) used to permanently or temporarily accommodate persons that includes a dwelling, residential hotel, motel, boarding house, holiday home or a bed & breakfast establishment that has an occupancy rate of at least 33%.

**“Council”** means the Denmark Shire Council;

**“Rural”** is land where *“rural pursuit”* is undertaken as per the definition within the Shire of Denmark Town Planning Scheme No 3 and is zoned for that purpose;

**“Special Rural”** is land where *“special rural pursuit”* is undertaken as per the definition within the Shire of Denmark Town Planning Scheme No 3 and is zoned for that purpose;

**“Special Residential”** is land where *“special residential pursuit”* is undertaken as per the definition within the Shire of Denmark Town Planning Scheme No 3;

**“Specifically tourist zoned land”** is land where a specifically zoned *“tourist related pursuit”* is undertaken as per the definition within the Shire of Denmark Town Planning Scheme No 3;

**“Gas gun”** means a gas gun or similar gun designed to scare birds from attacking crops, but does not include a firearm or any other bird scaring device;

**“Habituating”** means to accustom or get used to;

**“Residential building”** means a building used to permanently or temporarily accommodate persons and includes a dwelling, residential hotel, motel, boarding home, and bed & breakfast establishment.

### **4. General Issues**

- This Noise Management Plan not only defines how gas guns can be used but provides a conduit for open communication between residents and orchardists.
- Existing orchards will be considered to be exempt from the 500m & 1000m separation distances in this policy but bound by a 300m distance where it can be substantiated to the satisfaction of the CEO that they have been worked and picked commercially for the past 10 years and have used a gas gun for at least one week per season for 3 out of the last 5 years. This exemption however will be extinguished if special rural or special residential or specifically tourist zoned land is developed within 500 metres of that gas gun where in the opinion of the CEO reasonable noise attenuation measures have been implemented and 1000m where they have not.
- Perception of “noise” is subjective and consequently people react to noise in different ways. Noise in the environment can create nuisance to some persons but does not create nuisance to other persons. This Noise Management Plan recognises this fact. The level of “sound” can be objectively measured and quantified by a sound level meter and can be assessed against the *Environmental Protection (Noise) Regulations 1997*.

- This Noise Management Plan aims to provide clarity and certainty to residents on the extent of the noise impact of gas guns to their amenity with the general objective of ensuring that the impacts of noise from gas guns is limited and minimised to residents.
- It is acknowledged that the use of gas guns is only effective when used in conjunction with other bird scaring measures.

## **5. Council's Preferred Methods of Bird Control**

Council's preferred methods of bird control in order of preference area as follows:

### 1) Total netting of orchards

The total netting of orchards is Council's preferred solution on rural properties that have several nearby houses within a distance of 1000m of their potential gas gun location(s). This is because over the life of a set of nets there is a high likelihood that complaints will be received if gas guns or the manual firing of shot guns are used as the primary means of deterrent. It is Council's opinion that the full netting of orchards is the most sustainable deterrent option in the long term

### 2) The usage of top netting with sacrificial boundary trees on orchards that are within a 1000m to nearby rural houses is also strongly endorsed by Council providing orchardists are prepared to accept the loses on the sacrificial boundary trees as most birds do not like venturing under nets meaning that extensive usage of acoustic controls are normally not required.

### 3) The usage of sacrificial crops as diversion

While the usage of sacrificial crops as diversion is preferable when compared to the usage gas guns or the manual firing of shot guns as a means of diverting rather than deterring birds the commercial reality is that it will fail in some years due to bird species losing their primary food source due to wild fires in state forests. This temporary loss of a source can lead to a seasonal desperate bird risk meaning that orchardists who adopt sacrificial crops as a primary loss control strategy also need to have a contingency plan in place so that they are not forced to consider the use of acoustic measures at short notice.

It should be noted that one of the risks of the usage of sacrificial crops is that they can lead to long term bird population increases as they represent a reliable food source.

### 4) Timely manual firing of shot guns

While there is a risk that the manual firing of shot guns to scare birds heading into orchards will give rise to sporadic neighbourhood complaints this method represents an active and strategic method of bird control and only uses as many shots as are needed to deter the birds on that occasion. This type of noise is also significantly less disturbing than that of a gas gun as it is not relentless and occurs in response to an over flight by birds.

Council considers the usage of shot guns to scare birds heading into orchards to be part of normal farming operations and while it reserves the right for the CEO to have dialogue with orchardists regarding the number and frequency of the shots it considers that famers and orchardist have an "as of right" to use fire arms at their properties as part of their normal rural operations.

## 5) Electronic Bird Scarers

Electronic bird scarers use predator and distressed bird sounds, bells and sirens to interrupt and deter bird feeding by making the orchard a stressful place for birds.

While they are not as intrusive as gas guns, electronic bird scarers are still relentless in their operation and their design intention is to induce stress and confusion and for this reason it is recommended that they only be used where a distance of at least 500m to the nearest dwelling (nearby house) can be achieved. Notwithstanding the above recommended buffer distance Council, where complaints are received' reserves the right to apply the assigned noise levels found in the Environmental Protection (Noise) Regulations 1997 and to stipulate greater buffer distances where the terrain and or measured noise levels warrant.

## 6) Gas Guns

The usage of gas guns is discouraged in areas where neighbouring houses either already exist within 1000m of a gas gun or are likely to be built within 500m of a gas gun. Council's reasons for this are as follows:

- a) There is a high likelihood that at closer distances a gas gun's noise emissions may unreasonably interfere with the lifestyle, health and amenity of those residents.
- b) Council is of the opinion that rural pest control measures should be active and strategic and the automatic nature of gas guns encourages farmers to develop crops on the basis that they will be able to set the device going and be absent from the property. To this end one of the primary goals of this policy is to prevent absentee land holders developing intensive agriculture enterprises in rural areas that have significant residential occupancies on the basis of automated acoustic scaring devices.

## **6. Reasons for use of Acoustic Bird Scaring Devices**

Cockatoos, crows and 28 parrots are the main species of birds that cause damage to fruit in orchards in this region. Shooting to kill is the most effective method of reducing damage by birds and may be used for bird species such as 28's.

However shooting to kill is not a management option for protected species including black cockatoos. All species of black cockatoos that are found in Western Australia are listed as threatened (property owners should check with DEC for latest status) and cannot be shot or killed as a means of reducing damage to crops. Alternative methods of bird control such as Bird Frite type cartridges and movement in orchards therefore need to be applied and the use of acoustic bird scaring devices such as gas guns have become the primary cost effective means of controlling birds when they are used in an appropriate manner.

Bird attacks on orchards generally occur at dawn and dusk. Typically times are between 5.00am to 9.00am and 4.00pm to 7.00pm. Although the birds do not like to feed in the heat of the day, anecdotal evidence suggest that some may still remain in an orchard during the day and may increase in numbers towards the evening. Birds tend to leave orchards after dark.

The two periods for potential bird damage are therefore dawn and dusk and this coincides with the periods where residents generally expect a higher level of amenity.

It is critical that orchardists do not allow cockatoos to become habituated to the orchard in the early stages of the season. This can be achieved by managing the crop with a variety of scaring techniques, where birds attribute pain, fear or other adverse stimulus to the varying methods of managing this issue.

Inappropriate use of gas guns in isolation to other bird scaring measures will not achieve the above objectives and may actually attract birds from orchards in other districts that have finished harvesting.

## **7. Open Lines of Communication**

Previous experience on this issue has shown that open communication between orchardists and residents is an important tool to improve the level of good will and co-operation and therefore minimise complaints.

There is an expectation that orchardists inform residents of operational matters with gas guns prior to the season when fruit damage by birds is likely to occur.

## 8. Use of Gas Guns

Where the 1000m separation can be achieved or the CEO has recognised either an agreement between the orchardist and affected neighbours regarding a reduced distance or an existing usage right a person must not use or allow or authorise others to use a gas gun unless all of the following are satisfied:

- The gas gun is only used for the bona fide purpose of scaring birds from crops during a recognised crop growing period.
- Prior to using a gas gun there must be evidence that birds are threatening and habituating the orchard. It is a false premise that by using gas guns prior to this time it will keep birds away.
- Otherwise bird scaring is to be limited to a person operating a motorbike, quad bike or the like vehicle or manual shooting to scare etc, outside these “habituating” times.
- The gas gun is to be positioned on the farmer’s land.
- A gas gun must not be used during a total fire ban.
- The “as of right” distance in a straight line between the gas gun and a residential building on another property is 1000 metres or greater.
- Reductions of the above buffer distances to 300 metres may be granted by specific arrangements between an orchardist and the occupier of the affected dwelling. Any such arrangements will be taken as being for a maximum three seasons only and once entered into will be taken by Council as being for the entire season.
- A gas gun must not be located within 30 metres from an adjoining property boundary owned by someone other than the grower and/or user of the gas gun.
- A gas gun must be pointed away from known concentrated residential areas.
- Clause “F” of TOWN PLANNING SCHEME POLICY NO. 6 titled “GUIDELINES FOR THE MANAGEMENT OF VINEYARDS WITHIN SPECIAL RURAL ZONES” has the objective of ensuring that the management of the vineyards “Special Rural Zones” does not have a detrimental affect on the amenity of adjoining land owners reads as follows:

*“NO ARTIFICIAL BIRD CONTROL such as electronic noise emitters, discharge of firearms or chemical control shall be permitted”.*

- Where the foliage of the trees adjacent to the gas gun starts at lower than approximately 0.5 metres above the ground, a non-flammable barrier of at least 0.5 metres high should be placed on either side of the gas gun; and
- The times of use for gas guns shall be:

Mondays to Saturdays

Gas guns can commence operation at official sunrise but not earlier than 6.00am and be turned off at sunset but not later than 7.00pm;

Sundays

Gas guns can commence no earlier than 7.00am and must be turned off at sunset but not later than 7.00pm;

The official sunrise and sunset times can be confirmed at the following link:

<http://www.eldersweather.com.au/wa/southern-coastal/denmark>

- In addition to the point above relating to the times of use, gas guns are required to be turned off in the middle part of the day (nominally 11.00am to 3.00pm). This time bracket is outside known feeding times.

## **9. Calibration of Gas Guns**

A gas gun must be set to not emit more than the number of blasts set out below:

- When a gas gun is used in isolation in the case of a single blast gas gun, time between blasts to be no less than six (6) minutes;
- When a gas gun is used in conjunction and/or within 500 metres from another gas gun, in the case of a single blast gas gun, time between blasts to be no less than ten (10) minutes for all gas guns;
- In the case of a double blast gas gun, time between blast sequences apply as per above.

### **Note:**

In relation to dot point 1 above, a gas gun that is “used in isolation” means a gas gun used 500 metres or more from another gas gun.

In relation to dot points 1, 2 and 3 above, the intent of “used in isolation” and the set volley times apply to all gas guns regardless of the ownership and/or location of the gas guns.

## **10. Number of Gas Guns**

The number of gas guns in use at any one time on a property is as follows:

- Where the area under crop is three hectares or less – one gas gun;
- Where the area under crop is more than three hectares and less than eight hectares – two gas guns;
- Where the area under crop is eight hectares or more – a maximum of three gas guns.

## **11. Management of Noise**

Noise complaints or any issues of discussion regarding use of gas guns are to be directed to the orchard manager. Contact details of the orchard manager shall be displayed at the entrance to the premises. The Council remains the Authority where a formal complaint can be lodged if an issue cannot be satisfactorily resolved between a resident and orchardist.

## **12. Review of the Noise Management Plan**

The Noise Management Plan may be reviewed by Shire Officers for effectiveness as necessary and a report provided to Council.

## **13. On-going commitment to reducing the impact of Bird Scaring Devices**

There is a commitment by orchardists to continually investigate and implement alternative bird control measures balancing the effectiveness and cost to orchardists.

Therefore consideration by orchardists will be given to netting for high value fruit grown on high-density trellis systems. New high-density trellis systems will be constructed with netting in mind.

## **14. Failure to comply with the Noise Management Plan**

The procedure outlined in this Noise Management Plan is to be considered as best practice for bird scaring. If the Noise Management Plan is not adhered to the Noise Management Plan will lapse and the orchardists will be expected to comply with the provisions of the Environmental Protection (Noise) Regulations 1997.

Notwithstanding the above, failure of one orchardist to comply with the Noise Management Plan (where the provisions of the Environmental Protection (Noise) Regulations 1997 will apply) will not prejudice other orchardists in that the Noise Management Plan does not lapse for all the orchardists.

Failure to comply with the Environmental Protection (Noise) Regulations 1997 carries for the following penalties:

- Seizure of equipment, or any part of the equipment which is emitting, or contributing to the making of unreasonable noise under Section 81A or 99A of the Act;

- An Infringement Notice may be served under Section 99K of the Act, which carries a penalty of \$250.00 for the first offence and \$500.00 for the second and subsequent offences;
- A Noise Abatement Direction may be served directing members of the premises to cease making or contributing to the making of unreasonable noise (maximum penalty \$25,000);
- An Environmental Protection Notice specifying the action to be taken to abate the nuisance may be served. An Environmental Protection Notice while it exists, binds the occupiers upon whom it is served (maximum penalty \$62,500).

**Note:**

In relation to the above, the Act refers to the *Environmental Protection Act 1986*, of which the *Environmental Protection (Noise) Regulations 1997* is subsidiary legislation to.

Useful Website links:

[http://www.agric.wa.gov.au/objtwr/imported\\_assets/content/pw/vp/bird/best\\_practice\\_guidel\\_1\\_6684b.pdf](http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/vp/bird/best_practice_guidel_1_6684b.pdf)

[http://www.agric.wa.gov.au/objtwr/imported\\_assets/content/pw/vp/bird/noise\\_bird\\_brochure.pdf](http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/vp/bird/noise_bird_brochure.pdf)

**Best Practice Guidelines for  
Bird Scaring in Orchards  
noise and threatened species**



December 2005

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## Purpose

These guidelines are intended to help fruit growers, residents and local government authorities manage environmental noise from gas guns and other noisy devices used in orchards to prevent fruit damage by threatened black cockatoos.

The Western Australian State Government in consultation with the WA Fruit Growers Association has produced these guidelines in line with its commitment to protect threatened bird species, the viability of the fruit growing industry and the welfare and amenity of residents.

These guidelines apply specifically to situations where the bird species causing damage is classed as threatened under the *Wildlife Conservation Act 1950*. There is also potential application for controlling birds for which no approval for shooting to kill is required and for those situations where a damage licence would usually be obtained.

Best practice recommendations for reducing the impacts of black cockatoos on commercial fruit crops include techniques such as visual and auditory scaring devices and physical barriers such as wires and exclusion netting. The operation of noise-generating devices can create problems for neighbours and exceed maximum levels prescribed under the *Environmental Protection (Noise) Regulations 1997*. Local governments have the delegated responsibility of administering these noise regulations.

## Introduction

### Background

There are three species of black cockatoo native to south-west Australia, with two species known to enter orchards. The forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) has not been recorded damaging fruit crops and Carnaby's cockatoo (*Calyptorhynchus latirostris*) has been recorded damaging only nut (almond, pistachio and macadamia) and persimmon crops. However, Baudin's cockatoo (*Calyptorhynchus baudinii*) has a long history of damaging apple, pear and some stone fruit crops.

Damage to crops typically occurs in the first few hours after sunrise and the last few hours before sunset, but is not exclusively restricted to those periods. Peak damage is usually recorded during months of late summer and autumn, but may occur at other times during the fruit growing season.

**All black cockatoo species that occur in WA are listed as threatened and cannot be shot or killed as a means of reducing damage to crops.**

**Since shooting to kill is not a management option for black cockatoos that cause damage to crops, alternative methods need to be considered and applied.**



## Noise and its effects

Noise is defined as unwanted sound. A fruit grower may not consider the sound of a gas gun as noise, yet a neighbour could consider it noise if it disturbs their rest or recreational activities. It would be reasonable to expect that a noise disturbance designed for birds would also disturb people.

A number of objective and subjective factors affect a person's response to noise.

### Objective factors include:

- level of the noise;
- emergence of the noise above background levels;
- nature of the noise, its duration and how often it occurs;
- characteristics of the noise – tonality ('humming' or 'whining', some electronic bird scarers might contain this characteristic), modulation (regular changes in level or pitch, e.g. a siren, electronic bird scarers can fall into this category) or impulsiveness ('banging' or 'knocking', gas guns have this characteristic depending on how far the receiver is from the source); and
- time of day or week that the noise occurs.

### Subjective factors include:

- activity of the person receiving the noise and their state of health or mind;
- attitude of the person receiving the noise to the noise source or noise emitter;
- information content of the source (a noise may be recognised and trigger fear, or alternatively, be familiar and comforting);
- controllability of the source (a noise source may be less annoying if it can be controlled by closing a window for example); and
- expectations of the community.

## Managing noise

In some circumstances, and especially under certain weather conditions, bird scaring devices will breach noise regulations and will therefore cause problems for neighbours.

The *Environmental Protection Act 1986* defines 'unreasonable noise' in two main ways; subjectively or by breach of a prescribed standard.

1. The subjective definition looks at the nature and duration of the noise emissions, the frequency of similar emissions from the same source, the time of day at which the noise is emitted and whether the noise unreasonably interferes with the health, welfare, convenience, comfort or amenity of any person receiving the noise.
2. The *Environmental Protection (Noise) Regulations 1997* are the prescribed standard under the Act.

The noise regulations specify assigned noise levels that are the levels of noise allowed to be received at premises at a particular time of day. There are different assigned levels depending on the type of receiver. These are categorised as:

- noise-sensitive premises (residences);
- commercial premises (shops, offices); and
- industrial premises (factories, mines).

The assigned levels for noise-sensitive premises vary depending on the time of day, being lower at night when people are more sensitive to noise. For noise-sensitive premises, the assigned levels also depend on how close the house is to industrial and commercial areas and to major roads.



The noise regulations also require that the noise source be 'free' from annoying characteristics (specifically tonality, modulation and impulsiveness) and set out objective tests to assess whether the noise contains any of these characteristics. If these characteristics cannot reasonably and practicably be removed, then a series of adjustments are provided to add to the measured levels. The measured levels adjusted for the presence of annoying characteristics must then comply with the assigned levels.

The assigned noise levels are designed to provide a good level of noise amenity for occupiers of noise-sensitive, commercial and industrial premises.

### **Crop protection**

Protecting crops involves scaring and repelling techniques that can include the use of audible, visible, physical or chemical means to discourage or frighten birds away from crops. The birds may be frightened by something new and unusual in their environment (e.g. flashing lights or strange sounds) or by something that simulates a threat (e.g. a gun or predator).

Early action should be taken before the birds become familiar with the orchard as a food source, as once birds are habituated to feeding on crops it is more difficult to scare them away.

Studies indicate that scaring devices used in isolation tend not to work, but when a number of devices are used in rotation, damage may be reduced. When the strategies outlined below are followed, scaring is more likely to be effective against parrots, cockatoos and other species.



It is also important that the birds associate human activity with danger. They soon lose their fear of humans if not harassed with real or simulated danger. Shooting to scare using pyrotechnic cartridges, should be initiated before using other scaring devices to establish an association between noise and real danger.

Scaring is safer in built-up areas than the use of live ammunition and it is a non-lethal method for dealing with bird damage. However, other scaring devices are usually expensive and gas cannons and cracker cartridges can be a minor fire risk in dry conditions. Some devices may breach noise regulations and/or cause conflict between neighbours, so, if in doubt, enquiries should be made with your local government and neighbours.

Every situation is different. Scaring combinations that work at one orchard may not work at another, and not all bird species react the same way to a particular control option.

The use of exclusion netting is preferred to guns or gas guns, but is a major capital investment for growers. There currently aren't any subsidy schemes for purchasing and installing netting for fruit crops affected by black cockatoos.

### **Scaring devices**

There is a range of acoustic and visual bird scaring devices commercially available, including firearms, electronic noisemakers, recorded bird distress and predator calls, gas fuelled exploders (gas cannons) and motorcycles. The sound produced by stationary scaring devices can be maximised by pointing them downwind, raising them off the ground and camouflaging them so the birds do not associate the sound with the device. Gas cannons and pyrotechnic cartridges can be an effective means of dispersing birds from crops and orchards.

Gas (propane) cannons are powered by LP gas cylinders and are available in a range of configurations from mechanically controlled single-shot



units to others that produce random series of single, double, and triple-shot clusters, adjustable from every 30 seconds to every 20 minutes. The gas cannon can be mounted so that it rotates to improve effectiveness. The use of a pre-set timer allows selection of activation times. Gas-cannons are safe, and cost- and time-effective, as they do not require the presence of an operator.

Pyrotechnic cartridges ('Bird-Frite', 'Screamer-Siren' and 'Bird-Banger') are used to reinforce the effect of gas cannons and are usually fired from shotguns. They either make a siren-like sound as they fly or travel 30 to 50 metres before exploding with a loud bang. Cartridges are costly, there is some fire risk associated with their use and they require an operator.

Electronic noisemakers broadcast synthetic electronic sounds that are claimed to be unsettling for birds and can either be distress calls or mimic the sound of birds of prey. As some devices produce sound like real birds they may be considered less irritating to neighbours than propane cannons. Other devices produce artificial sounds.

Any human activity in orchards, such as operating vehicles or trail bikes, has been shown to be effective in displacing birds from orchards. Hand-held lasers, visible in low light conditions, may be useful in deterring some bird species from orchards. Lasers are simple to use and require an operator but birds supposedly do not get used to the laser beam.

### **Important things to remember when using bird scaring devices**

- Persistence is required. Scaring devices should be used throughout the damage period, but only during the periods of the day when the birds are likely to be feeding in the area.
- When birds causing the problem are nomadic, crops should be regularly checked for signs of damage. Early action can then be taken before the birds become reliant on the crop for food or develop a habit of coming to that crop.
- When birds are resident, scaring devices or shooting should be used occasionally throughout the year to maintain a degree of wariness in birds and to indicate that the area is not safe for feeding.
- If alternative undisturbed food sources (e.g. fallen or unpicked fruit) are not available in other areas, it may be difficult to move birds by scaring or repelling them. They may be reliant on the food in the crop and so may return to it.
- Shooting to scare only should be initiated before using other scaring devices to establish an association between noise and real danger, and only with a licence from the Department of Conservation and Land Management (CALM).
- Noise scaring devices should be introduced after the birds have developed a fear of the gun. Some shooting to scare may need to be maintained to reinforce the effect of the scaring devices.
- To maximise the effectiveness of bird scaring, noises should be irregular or random, change direction and location often and be integrated with other types of noises and bird scaring tactics.
- Once birds start to ignore a particular device, it should be removed immediately, otherwise the birds may begin to associate the device with a good food source.
- Combining a number of devices and using them in rotation maintains variety and improves effectiveness. This reduces the likelihood of birds becoming used to the devices.



- Collaboration with neighbouring growers can ensure that methods complement each other.
- Many scaring programs fail because damage usually occurs at a busy time of year and producers do not feel they can afford the time for intensive control efforts. Consideration should be given to employing someone just to run the crop protection program – a full-time person may not be required and consider sharing the cost with neighbours.

### Use of firearms

CALM recognises that a number of native bird species are pests in commercial fruit crops. According to the *Wildlife Conservation (Open Season for Birds Causing Damage) Notice 1998*, provision has been made for landowners, occupiers or authorised agents to shoot some pest birds in some parts of the State when they are causing damage or likely to cause damage to scare the rest of the flock. Damage licences to shoot to scare black cockatoos can be obtained from CALM but shooting to kill is not a management option for any of the three black cockatoo species.

Only licensed firearms can be used to shoot pest birds causing damage to crops. Only persons holding a licence or permit issued under the *Firearms Act 1973* may shoot pest birds. The safety of the public is essential and firearms should only be used where it is safe to do so.

## Guidance

### Best practice noise management

In the first instance, consider and adapt bird scaring methods that minimise noise impacts. Depending on the device, its orientation and surrounding topography, gas guns or other acoustic methods could comply with noise regulations if noise-sensitive receivers are at least one kilometre away from the device.

When using acoustic methods, best practice noise management needs to be followed.

#### 1. Communication

Growers are encouraged to develop a simple communication program to ensure affected neighbours are informed of any bird scaring activities.

The program should include the following:

- Discuss the bird scaring alternatives and potential noise with neighbours who may be affected.
- At the beginning of the damage season, provide neighbours and local residents, together with an information pamphlet, a letter that includes the following:
  - name and contact details of the grower;
  - location of orchard;
  - dates of the damage season; and
  - times when bird scaring devices will be operated.
- Consider signage along the property boundary, with local government approval, that would alert nearby residents to the possibility that they may experience noise during the fruit growing season.





## **2. Managing early morning noise**

People are sensitive to noise in the early morning, especially noise from unattended equipment like gas guns and electronic devices.

For effective scaring and minimal noise, a grower should be present and use a manual method such as motorbikes (or similar vehicles) or shotguns (shooting to scare). This ensures that noise is only emitted when necessary. If a grower is unable to be present, consideration should be given to hiring people trained in manual scaring.

Other automatic acoustic devices should be used only after manual scaring methods have been exhausted.

## **3. Best practice management of using gas guns**

- Use only after manual scaring has taken place for an extended period of time.
- Use no more than two continuous periods per day, and not **before** sunrise or **after** sunset.
- Best results will be achieved by preventing habituation to the device. Turn the device off when birds are not actively feeding during the day.
- Acceptance by neighbours of early morning use could be more forthcoming if the grower is in attendance while the gas guns are in operation.
- Ensure the firing rate is as low as possible to maintain the 'startle' effect. Several blasts in quick succession with 10 to 15 minutes between volleys are effective with no more than six volleys per hour. For the greatest effect, all devices around the crop and on adjacent properties should be synchronised to fire at the same time.
- Regularly move gas guns around the orchard. Ensure the gas guns are orientated in a fixed direction **away** from the nearest neighbour.

- Devices should be placed on the ground, ideally facing upwind. This uses the benefits of ground absorption and wind direction to reduce the noise received at greater distances. Wind direction has little effect on the noise levels received close to the gas gun.
- Attempts should be made to place barriers (such as hay bales) as close as possible to the gas gun and interrupting line-of-sight to the nearest residence. The gas gun should also be camouflaged so the birds do not associate the sound with the device.

## **4. Long-term strategy**

Commit to reducing the impact of acoustic bird scaring devices on the nearby residents over subsequent years.

# Bird scaring in orchards

## Checklist for fruit growers

*Are my bird scaring methods following best practice?*

**I have a noise management strategy that is workable and realistic.**

**My noise management strategy involves a diverse number of methods as outlined in the *Best Practice Guidelines for Bird Scaring in Orchards*.**

**My noise management strategy prevents the birds getting used to the scaring methods I use.**

**I have a communication plan for informing my neighbours about my noise management strategy.**

**At the beginning of the damage season I have informed all my neighbours about the bird scaring methods I use and provided them an information pamphlet.**

**At the beginning of the damage season I have provided other residents in the area with an information pamphlet.**

**For more information, contact:**

**Department of Agriculture – 9368 3333**

**Department of Conservation and Land Management – 9334 0333**

**WA Fruit Growers Association – 9455 2075**

**Your local government authority –**

**Tick**

### **Local government authority procedure**

Local government authorities aim to protect the noise environment while allowing the protection of black cockatoos and fruit crops.

The recommended procedure for local government when dealing with noise complaints includes:

1. The local government should ensure both complainants and growers have the available information about bird scaring in orchards (e.g. pamphlet, *Best Practice Guidelines for Bird Scaring in Orchards*, CALM/Ag Notes).
2. Use informal mediation to achieve acceptable bird-scaring regimes based on the best practice guidelines.
3. If damage mitigation methods or compliance with noise regulations are in dispute, the local government should assess the impact of noise emission with regard to:
  - the type of scaring method and duration, time of day; and
  - the noise level, and presence of tonality or impulsiveness.
4. The local government should encourage the fruit grower to explore ways of reducing noise in accordance with the guidelines by:
  - reducing use of acoustic methods by using other methods, including both short and long term, such as using visual scarers or netting; and
  - reducing the noise emissions from acoustic methods, such as using barriers or placement to reduce the noise level or by reducing the number of blasts from gas guns.
5. The local government or an independent mediator should arrange formal mediation to develop a mutually agreed noise management plan for bird scaring for the orchard.



A Noise Management Plan for acoustic bird scaring devices is a document outlining negotiated conditions designed to minimise the impact of bird scaring devices on neighbours. A plan should be specific to one orchard (or a collection of adjacent orchards) and the surrounding neighbours.

The conditions in the plan will follow the guideline and should include:

- limits on the days and times of operation of the bird scaring devices;
- limits on the operating rate of the bird scaring devices;
- orientation and rotation of the devices;
- timing, amount and method of notification of operating times provided to neighbours;
- complaint response procedure; and
- commitment to a strategy to reduce the impact of the bird scaring devices over time.

The Noise Management Plan is not a legal document and is intended only to record the conditions considered acceptable to all parties involved.

Where best practice is not followed, the local government should insist that the grower comply with the provisions of the noise regulations. The local government retains the discretion to exercise the relevant powers under the *Environmental Protection Act 1986*.

#### **For more information**

Visit the 'living with wildlife' section of CALM's NatureBase website ([www.naturebase.net](http://www.naturebase.net)) and download

- Fauna Note No. 03/2005 *Netting to reduce bird damage*; and
- Fauna Note No. 02/2005 *Scaring and repelling birds to reduce damage*.

## References

*Environmental Protection Act 1986*  
*Environmental Protection (Noise) Regulations 1997*  
*Firearms Act 1973*  
*Wildlife Conservation Act 1950*  
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This document was prepared by the Black Cockatoo/Fruit Protection Technical Advisory Committee, comprising representatives from:

Office of the Minister for the Environment; Science

Department of Environment

Department of Conservation and Land Management (CALM)

Department of Agriculture

WA Fruit Growers Association

WA Local Government Association

Department for Planning and Infrastructure

City of Armadale



From: Charmaine Shelley

Sent: Tuesday, 22 January 2013 10:09 AM

To: Gregg Harwood

Cc: Robert Ohle

Subject: Complaint Re: Gas Guns Long Orchard Farm A4140 - 218 Glenrowan Rd Denmark

Hi Gregg,

As discussed please find attached info regarding Birds / gas guns / noise

Daniel who is the Manager of Long Orchard Farm has just called and spoke with me regarding last night's complaints - gas guns – A4140 218 Glenrowan Rd, Denmark.

Daniel has adjusted the timing of the shots to 8-9 detonations per hour (a lot more reasonable), he had also gone and spoke with all neighbouring properties regarding the matter, he said the response was 50% OK with it and the other 50% not very happy at all.

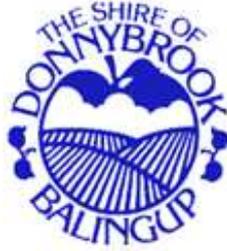
Complaints - calls I received last night were from...

[REDACTED]

[REDACTED] he had timed the shots at 18 shots in 5mins

[REDACTED] can be contacted on [REDACTED] email:

[REDACTED]



# **SHIRE OF DONNYBROOK-BALINGUP**

## **NOISE MANAGEMENT PLAN**

**For use of Gas Guns in areas surrounding Town Sites within the Shire of Donnybrook-Balingup**

*Adopted by Council Resolution 27 October 2010*

*Updated by Council Resolution 25 January 2012*

### **1. Introduction**

The purpose of this Noise Management Plan is to set out an effective procedure for scaring black cockatoos which minimises disruption to nearby residents when acoustic bird scaring devices are used.

This Noise Management Plan has been prepared based on best practice principles derived from known guidelines and/or local laws in place in Western Australia and other parts of Australia where orchards and residential areas are in close proximity.

This document has been prepared in consultation with representatives of orchardists, residents and the Shire of Donnybrook-Balingup.

The basis on why specified orchardists were invited to participate in this process is because it is known that they use gas guns in the control of bird damage to their orchards.

This Noise Management Plan applies to areas surrounding Town Sites within the Donnybrook-Balingup district where the likelihood of complaints being received on the interface of agricultural pursuits and lands either used or zoned for residential and/or lifestyle purposes where there is a greater likelihood of land use conflict.

Council has discretion in the enforcement of the *Environmental Protection (Noise) Regulations 1997* (the Regulations) and is prepared to accommodate "exceedences" of the Regulations if orchardists are committed to minimising the noise impact to nearby residents by complying with this Noise Management Plan.

## 2. Definitions

“**Another property**” means a property other than the property on which the gas gun is located and which is occupied by a person or persons other than the person who is using or who is allowing or authorising the use of a gas gun;

“**Council**” means the Donnybrook-Balingup Shire Council;

“**Farm land**” is land where “*rural pursuit*” is undertaken as per the definition within the Shire of Donnybrook-Balingup Town Planning Scheme No 4;

“**Gas gun**” means a gas gun or similar gun designed to scare birds from attacking crops, but does not include a firearm or any other bird scaring device;

“**Habituating**” means to accustom or get used to;

“**Residential building**” means a building used to permanently or temporarily accommodate persons and includes a dwelling, residential hotel, motel, boarding home, and bed & breakfast establishment.

## 3. General Issues

- This Noise Management Plan not only defines how gas guns can be used but provides a conduit for open communication between residents and orchardists.
- Variations to Clause 6 dot point 4 relating to buffer distances of 300 metres between gas guns and residential buildings may be granted by specific arrangements between an orchardist and the occupier of a dwelling.
- Perception to “noise” is subjective and consequently people react to noise in different ways. Noise in the environment can create nuisance to some persons but does not create nuisance to other persons. This Noise Management Plan recognises this fact. The level of “sound” can be objectively measured and quantified by a sound level meter and can be assessed against the *Environmental Protection (Noise) Regulations 1997*.
- This Noise Management Plan aims to provide clarity and certainty to residents on the extent of the noise impact of gas guns to their amenity with the general objective of ensuring that the impacts of noise from gas guns is limited and minimised to residents.
- It is acknowledged that the use of gas guns is only effective when used in conjunction with other bird scaring measures.

#### **4. Reasons for use of Acoustic Bird Scaring Devices**

Cockatoos, crows and 28 parrots are the main species of birds that cause damage to fruit in orchards in this region. Shooting to kill is the most effective method of reducing damage by birds and may be used for bird species such as 28's.

However shooting to kill is not a management option for protected species including black cockatoos. All species of black cockatoos that are found in Western Australia are listed as threatened and cannot be shot or killed as a means of reducing damage to crops. Alternative methods of bird control therefore need to be applied.

The use of acoustic bird scaring devices such as gas guns have become the primary cost effective means of controlling birds when used in an appropriate manner.

Bird attacks on orchards generally occur at dawn and dusk. Typically times are between 5.00am to 9.00am and 4.00pm to 7.00pm. Although the birds do not like to feed in the heat of the day, anecdotal evidence suggest that they may still remain present in the orchard and may increase in numbers in the evening. The birds tend not to remain in the area after dark.

The two periods for potential bird damage is therefore dawn and dusk and this coincides with the periods where residents generally expect a higher level of amenity.

It is critical that orchardists do not allow cockatoos to become habituated to the orchard in the early stages of the season. This can be achieved by managing the crop with a variety of scaring techniques, where birds attribute pain, fear or other adverse stimulus to the varying methods of managing this issue.

**Inappropriate use of gas guns in isolation to other bird scaring measures will not achieve the above objective.**

#### **5. Open Lines of Communication**

Previous experience on this issue has shown that open communication between orchardists and residents is an important tool to improve the level of good will and co-operation and therefore minimise complaints.

There is an expectation that orchardists inform residents of operational matters with gas guns prior to the season when fruit damage by birds is likely to occur.

## 6. Use of Gas Guns

A person must not use or allow or authorise others to use a gas gun unless all of the following are satisfied:

- The gas gun is only used for the bona fide purpose of scaring birds from crops during a recognised crop growing period;
- Prior to using a gas gun there must be evidence that birds are threatening orchards and habituating the orchard. It is a false premise that by using gas guns prior to this time it will keep birds away;
- The gas gun is positioned on farm land;
- The “as of right” distance in a straight line between the gas gun and a residential building on another property is 300 metres or greater;
- A gas gun must not be located within 30 metres from an adjoining property boundary owned by someone other than the grower and/or user of the gas gun;
- A gas gun must be pointed away from known concentrated residential areas;
- Where the foliage of the trees adjacent to the gas gun starts at lower than approximately 0.5 metres above the ground, a non flammable barrier of at least 0.5 metres high should be placed on either side of the gas gun; and
- The times of use for gas guns shall be:

➤ Mondays to Saturdays

Gas guns can commence operation at official sunrise but not earlier than 6.00am and be turned off at sunset but not later than 7.00pm;

➤ Sundays

Gas guns can commence no earlier than 7.00am and must be turned off at sunset but not later than 7.00pm;

The official sunrise and sunset times can be confirmed at the following link:

**<http://www.eldersweather.com.au/wa/southwest/donnybrook>**

- In addition to the point above relating to the times of use, gas guns are required to be turned off in the middle part of the day (nominally 11.00am to 3.00pm). This time bracket is outside known feeding times.

Orchardists may use gas guns with other scaring measures in this period if it can be demonstrated that birds are “habituating” an orchard in this time. Various scaring techniques such as bird frite, shooting to scare and gas guns may be used until the birds have been removed;

- Outside these specified times for use of gas guns, bird scaring is to be limited to a person operating a motorbike, quad bike or the like vehicle or manual shooting to scare etc.

## **7. Calibration of Gas Guns**

A gas gun must be set to not emit more than the number of blasts set out below:

- When a gas gun is used in isolation in the case of a single blast gas gun, time between blasts to be no less than six (6) minutes;
- When a gas gun is used in conjunction and/or within 500 metres from another gas gun, in the case of a single blast gas gun, time between blasts to be no less than ten (10) minutes for all gas guns;
- In the case of a double blast gas gun, time between blast sequences apply as per above.

### **Note:**

In relation to dot point 1 above, a gas gun that is “used in isolation” means a gas gun used 500 metres or more from another gas gun.

In relation to dot points 1, 2 and 3 above, the intent of “used in isolation” and the set volley times apply to all gas guns regardless of the ownership and/or location of the gas guns.

## **8. Number of Gas Guns**

The number of gas guns in use at any one time on a property is as follows:

- Where the area under crop is three hectares or less – one gas gun;
- Where the area under crop is more than three hectares and less than eight hectares – two gas guns;
- Where the area under crop is eight hectares or more – a maximum of three gas guns.

## **9. Management of Noise**

Noise complaints or any issues of discussion regarding use of gas guns are to be directed to the orchard manager. Contact details of the orchard manager can be obtained from the Donnybrook-Balingup Shire Office on PH: (08) 9780 4200. The Council remains the Authority where a formal complaint can be lodged if an issue can not be satisfactorily resolved between a resident and orchardist.

## **10. Review of the Noise Management Plan**

The Noise Management Plan may be reviewed by Shire Officers for effectiveness as necessary and a report provided to Council.

## **11. On-going commitment to reducing the impact of Bird Scaring Devices**

There is a commitment by orchardists to continually investigate and implement alternative bird control measures balancing the effectiveness and cost to orchardists.

Therefore consideration by orchardists will be given to netting for high value fruit grown on high-density trellis systems. New high-density trellis systems will be constructed with netting in mind.

## **12. Failure to comply with the Noise Management Plan**

The procedure outlined in this Noise Management Plan is to be considered as best practice for bird scaring. If the Noise Management Plan is not adhered to the Noise Management Plan will lapse and the orchardists will be expected to comply with the provisions of the *Environmental Protection (Noise) Regulations 1997*.

Notwithstanding the above, failure of one orchardist to comply with the Noise Management Plan (where the provisions of the *Environmental Protection (Noise) Regulations 1997* will apply) will not prejudice other orchardists in that the Noise Management Plan does not lapse for all the orchardists.

Failure to comply with the *Environmental Protection (Noise) Regulations 1997* carries for the following penalties:

- Seizure of equipment, or any part of the equipment which is emitting, or contributing to the making of unreasonable noise under Section 81A or 99A of the Act;

- An Infringement Notice may be served under Section 99K of the Act, which carries a penalty of \$250.00 for the first offence and \$500.00 for the second and subsequent offences;
- A Noise Abatement Direction may be served directing members of the premises to cease making or contributing to the making of unreasonable noise (maximum penalty \$25,000);
- An Environmental Protection Notice specifying the action to be taken to abate the nuisance may be served. An Environmental Protection Notice while it exists, binds the occupiers upon whom it is served (maximum penalty \$62,500).

**Note:**

In relation to dot points 1, 2, 3 and 4 above, the Act refers to the *Environmental Protection Act 1986*, of which the *Environmental Protection (Noise) Regulations 1997* is subsidiary legislation to.

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## Audible bird scaring devices

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### *Environmental noise guidelines*





# **Audible bird scaring devices**

*Environmental noise guidelines*

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**Audible bird scaring devices**  
*Environmental noise guidelines*

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**CONTENTS**

**PREFACE ..... 1**  
**INTRODUCTION ..... 3**  
**REGULATORY FRAMEWORK ..... 4**  
**PRINCIPLES ..... 5**  
**PERFORMANCE-BASED OBJECTIVE..... 7**  
**MANAGEMENT GUIDELINES ..... 10**  
**GLOSSARY ..... 16**  
**APPENDIX 1 ACCUMULATED PEAK LEVEL TECHNICAL INFORMATION (APL) ..... 18**  
**APPENDIX 2 BIRD MANAGEMENT PLAN OUTLINE ..... 22**

**List of tables**

**Table 1 Maximum APL according to location of receiver ..... 7**  
**Table 2 Maximum values associated with single device..... 7**



## PREFACE

This document provides a development assessment and compliance tool to assist developers, planning and enforcement authorities, and the broader community in the assessment of environmental noise impacts from audible bird scaring devices when used in an appropriate rural zone intended for agricultural activity.

The core objective of these guidelines is to provide a balance between the ability of primary producers to protect their crops from bird damage and the protection of the surrounding community from associated noise impacts.

A specific approach is required for audible bird scaring devices, one which recognises the unique noise-generating characteristics of these devices and the adverse impacts they can have on the community.

The guidelines are separated into three major sections:

- a set of agreed principles
- a performance-based objective reflecting those principles
- management guidelines reflecting best practice bird management and those principles.



## INTRODUCTION

### Objectives

Managing orchards and vineyards, bird populations, and efforts to scare birds from sensitive production while not impacting unreasonably upon the quality of life of nearby residents (and still returning a profit) is not a simple matter; nor is there a simple solution.

Existing measures to regulate the use of audible bird scaring devices to protect primary production tend to provide some certainty of use for operators and nearby residents, but their operation is still leading to impacts and conflicts. Although dissatisfaction with the current management system is geographically widespread, the intensity of concern appears to vary significantly between regions.

Problems seem to be most severe in cases where:

- residents are exposed to multiple impacts (ie, a number of adjacent properties, with each one operating within guidelines, but collectively generating significant disturbance)
- devices are being used with little strategic management (eg, being left to run all day by absentee managers).

The adoption of an accumulated peak level (APL) performance-based objective will shift the compliance emphasis from behaviour (eg, the number of discharges per hour) to one of impact (ie, the cumulative effect on any 'receiver'). This shift will provide a fairer means of dealing with multiple impacts and more closely reflect the duty of care established under the *Environment Protection Act 1993* (the EP Act). It also aligns with the direction that can be expected to emanate from courts as they consider the sort of evidence available from relevant research and recent cases.

This approach, however, may result in less clarity for an operator, or for nearby residents, as to what behaviour is acceptable. The proposed management guidelines section of this document (especially those for operating gas guns) address that concern by providing 'rules of thumb' for operators.

The management guidelines section (see Page 10) also recommends the development of bird management plans, in cases where there is a risk of noise impact, to promote the strategic and integrated management of audible bird scaring devices. It also introduces the concept of an area bird management plan to more effectively deter birds and to alleviate potential impacts in multi-property situations. The preparation and implementation of the plans are expected to assist the grower in improving the effectiveness of the devices while minimising their impact on the surrounding community.

## REGULATORY FRAMEWORK

### Duty of care

The EP Act places a duty of care for the environment, the general environmental duty, on all South Australians. Section 25 of the Act, states:

A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

Noise is a form of pollution that may result in environmental harm.

When determining what measures are reasonable and practicable for a specific situation, the EP Act requires consideration of:

- the nature of the pollution and the sensitivity of the receiving environment
- the financial implications associated with applying a measure
- the state of technical knowledge about appropriate measures and the likelihood of that knowledge being successfully applied.

Assessments of environmental harm include consideration of:

- the degree and scale of impact
- the health and safety of people
- property damage
- unreasonable interference with the amenity of an area.

These EPA Guidelines indicate the standard of care that is likely to be required for the purposes of securing compliance with the general environmental duty (the duty). The document provides a level of flexibility for some specific situations so that the duty may be more readily applied in a range of circumstances.

These guidelines are given effect through the issue of an Environment Protection Order under Part 7 of the *Environment Protection (Noise) Policy 2007* or Noise Policy.

## PRINCIPLES

The following principles for the use of audible bird scaring devices are not in any order of priority:

- **Audible bird scaring devices**

Primary production businesses are of economic value to regional communities and the state, and are a source of income for their proprietors. Their profitability can be affected by bird damage. Effective and acceptable bird control measures, including audible bird scaring devices, are required to avoid personal and community losses.

- **Noise**

Noise is an important element of bird scaring, but to be effective it must be part of a multi-faceted 'best practice' approach.

- **Unreasonable interference**

All occupiers of land have a right to be protected from unreasonable interference in the enjoyment of their property. That level of protection should be commensurate with the expected level of amenity as reflected in the development plan zoning for the area.

- **Health**

Noise from inappropriate bird scaring practices can have a severe impact on people's enjoyment of their property and may affect their mental and physical health.

- **Self-regulation**

Individual growers need better information on birds scarers and their impact. Industry may require assistance in providing education and training regarding best practice bird scaring. A pro-active approach by industry to develop and adopt self-regulation measures will provide more effective local bird management and assist in avoiding adverse impacts on local communities, conflicts and the imposition of external regulatory controls.

- **Communication and mediation**

Primary producers must accept responsibility to use scaring devices in a manner that does not unreasonably interfere with the enjoyment of the area by other residents. Communication between primary producers and with neighbours will help to minimise any unreasonable interference. However, in the event of a dispute, if all parties are to have confidence in receiving fair treatment, the whole community needs to accept a role in reconciling conflicts and providing a transparent complaint management process.

- **Planning controls**

Local government development controls could be amended to minimise future conflicts by better keeping potentially conflicting land uses (such as residential and agriculture) separate and specifying the desired amenity of each. Regional variations in industry and community structure and expectations could be reflected in local development controls.

- **Buyer advice**

Where existing development controls generate potential conflict, land occupiers and potential purchasers should be advised of the situation, the amenity they can expect within the land use zone of the property, and the likely need for communication and compromise with neighbours.

- **Regulation**

A legislative framework will be required to underpin any industry-led self-regulation program. Local and state government administrators of legislation, regulations and policies will still require adequate resources to meet their enforcement obligations.

- **Research and development**

Ongoing research and education is required into bird management and bird scaring options, and their impact on birds and property operations, and the mental and physical health of affected people.

## PERFORMANCE-BASED OBJECTIVE

### Objective

The operation of any audible bird scaring device or combination of devices must not result in unreasonable interference to neighbouring residents.

An unreasonable interference to neighbouring residents is defined by the following maximum limits.

#### *Maximum accumulated peak level (APL) for impulsive noise devices*

- Impulse noise, generated as part of an integrated bird scaring strategy, at an APL of 118 dB is deemed to represent the maximum level of reasonable interference in a zone specifically intended for primary production.
- Impulse noise, generated as part of an integrated bird scaring strategy, at an APL of 115 dB is deemed to represent the maximum level of reasonable interference at the interface between a zone specifically intended for primary production and one for rural living or residential amenity<sup>1</sup>.

Table 1 Maximum APL according to location of receiver

Location of receiver	Maximum APL (dB)
Primary production zone	118
Interface between primary production zone and residential or rural living zone	115

#### *Maximum limits*

Notwithstanding compliance with the performance-based objective, the following maximum values associated with any single device must not be exceeded:

Table 2 Maximum values associated with single device

Parameter	Maximum value
Maximum noise level from any shot	100 dB(LinPeak)
Maximum number of shots in any hour	6

Noise from audible bird scaring devices before 7 am or after 8 pm must not exceed a  $L_{Amax}$  noise level of 45m dB(A).

The Maximum APL is assessed at the nearest noise-sensitive location in accordance with the measurement procedure provided in the Noise Policy.

<sup>1</sup> A buffer zone can be used to separate horticultural and residential land use to ensure that an interface between these conflicting land uses does not occur. The maximum APL should be specifically determined in such a situation. It should also be determined where the noise-sensitive land uses differ from a typical dwelling, such as schools, animal-holding areas or public roads.

The APL has been established based on relevant research and does not require adjustment penalties that may be applied to other noise sources under the Noise Policy.

### **Explanatory note**

The EP Act requires a balance between long- and short-term economic, environmental, social and equity considerations.

The principles that provide guidance in this balance are:

- audible bird scaring devices—bird damage can substantially affect the profitability of primary production
- noise—noise is an important element of bird control, but must be part of a multi-faceted approach to be of lasting effectiveness
- unreasonable interference—the Act requires that the surrounding community should not be subject to unreasonable interference in the enjoyment of their premises.

The factors that will affect the balance between the generation of noise and its impact upon neighbours are:

- the effectiveness of audible bird scaring devices
- the amenity of the area in which the surrounding community is located.

#### ***The effectiveness of bird scaring devices***

The balance will be very different should the devices provide limited effectiveness. With limited effectiveness and the associated loss of economic value, unreasonable interference will start at much lower levels of noise.

Audible bird scaring devices are only effective when part of a multi-faceted approach.

A central concept in these guidelines, therefore, is to establish that primary producers are using audible bird scaring devices as part of a multi-faceted or integrated approach to bird control. This can be done through the review of a bird management plan as prepared and implemented by the primary producer. This is discussed further in the management guidelines section.

#### ***Amenity of the area***

The balance will also be affected depending on the amenity of the surrounding community. If the community is located in a dedicated zone for primary production, higher levels of noise will be acceptable compared to that of a community located in a dedicated residential or rural living zone.

## Unreasonable interference from impulsive noise

The study *Community Reaction to Noise from an Artillery Range*<sup>2</sup> found that the APL was the superior measure in relation to estimating the community reaction to a broad range of impulsive noise.

The performance-based objective draws on the results of this study.

Appendix 1 provides a detailed analysis and measurement procedure associated with the APL descriptor.

The study is considered to provide the best available information to underpin these guidelines. A search of available literature around the world indicates there is limited information to provide a relationship between impulsive noise and health effects at noise levels at and beyond those recommended.

The World Health Organization published a comprehensive document (*Guidelines for Community Health 1999*) linking noise levels with health effects. Although comprehensive, the document does not specifically address the impact of repetitive impulsive noise. As such, it provides limited guidance with respect to suitable criteria for audible bird scaring devices.

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<sup>2</sup> Bullen RB, Hede AJ and Job RFS 1991, 'Community reaction to noise from an artillery range', *Noise Control Engineering Journal*, 37/3, pp 115-127.

## MANAGEMENT GUIDELINES

### Introduction

This section outlines the elements that should be considered in the application and achievement of the performance-based objective and is intended to assist in interpreting the grower's requirements under the EP Act.

### Reasonable and practicable measures

The following practices are elements of what would be expected to be 'reasonable and practicable measures' to mitigate any impacts from bird scaring devices.

#### *Bird management plan*

A grower must have a bird management plan if the operation of audible bird scaring devices has an unreasonable interference on the surrounding community.

A bird management plan should outline the grower's integrated bird scaring and management strategies, and should contain certain elements to achieve this. An outline of the elements of a bird management plan is provided in Appendix 2.

It is expected that each site will have a specific plan that may vary from season to season and from one crop or part of the property to another.

#### *Operating gas guns*

The technical discussion relating to APL in Appendix 1 will assist in understanding the options associated with acceptable gas gun location and operation. An acoustic engineer can assist in exploring these options further.

An understanding of these options will provide the grower with a flexible approach to gas gun use while limiting the impact on the surrounding community.

Notwithstanding the options available, the following four general operating procedures could be used to assist in complying with the performance-based objective.

### 1 Separation

The greater the separation between the gas gun and the nearest residence, the greater the noise level reduction. Noise levels will reduce noticeably for each doubling of this distance. As a rule of thumb:

- a typical gas gun located more than 300 m from a residence in a horticultural zone (or similar), restricted in operation to six shots per hour for 10 hours of the day should achieve the performance-based objective
- a typical gas gun located more than 500 m from a residence in a residential, country township, or rural living zone (or similar) restricted in operation to six shots per hour for 10 hours of the day should achieve the performance-based objective.

Testing of gas gun devices indicates that the resultant noise levels from one shot to the next, and from one model of gas gun to another can vary substantially. This variation can result in a need to increase significantly the separation distances nominated.

Care should also be taken to take topography into account, or where weather conditions may assist in propagating noise.

Topographically, the separation distance required will increase where the residence and gas gun are located on separate ridges with a valley between or, meteorologically, where temperature inversions may occur (eg, conditions approaching those that are suitable for the

formation of frost, typically restricted to the early morning hours) or where a slight breeze from the gas gun to the residence is prevailing.

Similarly, the distance may decrease under certain topographies (eg, a hill between the gas gun and receiver) or weather conditions (eg, a prevailing breeze away from the receiver).

Where there is reliance on achieving the performance-based objective through using the above simple 'rules of thumb', care should be taken to account for all the possible sources of this variation, and greater separation distances may be required.

Where more than one device is used on a property, or where concerns have been raised by the surrounding community, professional advice from an acoustic engineer should be sought to ensure compliance with the performance-based objective.

## 2 Rotation

Testing has also shown that substantial noise level reductions can be achieved by rotating the device away from the receiver. Subjectively, the loudness of a device can be perceived as being halved (approximately a 10-dB reduction) by rotating the device through 180° to face away from the receiver.

Primary producers should therefore face audible bird scaring devices away from the nearest residential receivers.

## 3 Reflection

The construction of a localised barrier adjacent to the gas gun that reflects and possibly absorbs the sound (in one direction) from the discharge of the gun can result in noise level reductions at the residence.

A barrier may provide additional flexibility in the possible location of the guns.

It is recommended that if a barrier is relied upon to achieve the performance-based objective, an acoustic engineer should assist in the design and testing of the barrier.

## 4 Hours of operation

Noise from audible bird scaring devices before 7 am or after 8 pm must not exceed a maximum noise level or  $L_{Amax}$  of 45 dB(A).

In comparison to the performance-based objective, a noise level of 45 dB(A) is extremely low and would require substantial separation distances to achieve.

As a rule of thumb, where it is likely that the devices will be audible at a residence, their operation in accordance with these guidelines should be restricted to between 7 am and 8 pm.

### *Electronic/speaker devices*

Electronic/speaker devices are another common form of audible bird scarer. Their noise characteristics generally comprise intermittent bursts of noise that attempt to imitate distress calls or to engender a bird distress response.

Therefore, the noise level is typically high in tone (similar to that of a screeching bird) and can modulate in amplitude (from being on or off), or modulate in frequency (ie, different screeching noises) as a result of the type of call.

The Noise Policy provides a means for adjusting noise levels that exhibit these types of characteristics.

The acceptable noise levels presented below for these types of devices should be achieved when accounting for penalties under the Noise Policy. For a typical electronic device, a 5-dB(A) penalty under the Noise Policy must apply as a minimum for tonality. Further penalties

may be applicable depending on the fundamental characteristics of noise from the actual device/s used.

The APL is a suitable noise descriptor for impulse noise. Electronic/speaker devices generally do not generate impulse noise.

A more suitable descriptor for electronic/speaker devices is the equivalent noise level ( $L_{Aeq}$ ), which is effectively an average noise level over the period of time that a device is operating. (Refer to the definitions section for the technical definition.)

The operation of any electronic/speaker audible bird scaring device must not result in an unreasonable interference to neighbouring residents.

An unreasonable interference to neighbouring residents is defined by the following maximum limits.

### ***Maximum noise level for electronic/speaker devices***

- Electronic/speaker noise, **generated as part of an integrated bird scaring strategy**, at an  $L_{Aeq}$  of **57 dB(A)** when measured and adjusted in accordance with the Noise Policy, is deemed to represent the maximum level of reasonable interference in a zone specifically intended for primary production.
- Electronic/speaker noise, **generated as part of an integrated bird scaring strategy**, at an  $L_{Aeq}$  of **52 dB(A)** when measured and adjusted in accordance with the Noise Policy, is deemed to represent the maximum level of reasonable interference at the interface between a zone specifically intended for primary production and one for rural living or residential amenity (or similar)<sup>3</sup>.

The maximum noise levels specified above are appropriate for use in development assessment and compliance. A 5-dB(A) adjustment for development assessment, as applied to other noise sources under Part 5 of the Noise Policy, should not be applied to them.

The noise level is assessed at the nearest noise-sensitive location in accordance with the measurement procedure provided in the Noise Policy.

The general operating procedures that apply to gas guns for rotation, reflection, and hours of operation should also apply to electronic/speaker devices as practicable. Some speaker systems are omnidirectional, in which case rotating and reflection will not be practicable noise reduction options.

Rule-of-thumb separation distances are not provided for electronic/speaker systems, given the large variation in noise levels that are possible from one system to the next. This is due to the number of speakers in the system, their distribution and the volume control associated with those speakers.

Noise level testing should be carried out when establishing a speaker system where interference with neighbouring properties may occur.

### ***Multiple properties***

The performance-based objective is based on the total impact at a receiver.

It is not uncommon, particularly with gas gun use, for multiple properties with different owners to contribute to the noise level at a single receiver, and for this receiver to be adversely impacted due to the cumulative effect of noise.

Therefore, the maximum APL under these guidelines may be exceeded at a residence where multiple properties, all using audible bird scaring devices, exist.

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<sup>3</sup> Where a buffer zone exists, the recommended noise level should be specifically determined.

A resident should not be exposed to levels that are in excess of the criteria under these guidelines either from a single property or as the result of the cumulative effect of a number of properties, due to the potential impacts this may cause.

**Where multiple properties using audible bird scaring devices generate cumulative noise levels in excess of the performance-based objective at a single receiver, each individual property that contributes to this cumulative impact must meet a maximum APL that is at least 5 dB less than that recommended in Table 1 unless a coordinated approach amongst the growers in accordance with these guidelines is implemented.**

Requiring an APL that is 5 dB less than that recommended in Table 1 is a simplistic approach in that it assumes each property contributes the same impact to that single receiver.

An alternative is to achieve the cumulative maximum APL in Table 1 through a coordinated approach amongst the growers.

It may be possible to reduce the cumulative impact of noise at a single receiver to achieve the objective criteria by concentrating on certain properties or devices used on those properties. Such an approach is expected to require the cooperation and coordination of the growers in the immediate region and the input of acoustic engineering advice.

The advantage of such an approach is that it may result in existing successful practices remaining unaltered while delivering more effective bird management over an area rather than just over a property. In addition, the issues of habituation of the birds to a scaring strategy and relocating the problem to another property can be better addressed through a coordinated approach.

It would be acceptable under these circumstances for the group to prepare an **area bird management plan**.

Examples of the responses that could be built into area bird management plans are:

- rationalisation of the number of audible devices, their relative locations and their discharge rate and timing
- rotation of the use of devices to different properties or portions of orchards during the day
- increased array and variation in the bird management measures, including visual as well as auditory measures.

### ***Communication for effective bird deterrence***

Given the potential for disturbance and misunderstanding associated with the use of audible bird scaring devices, it is sound practice for operators to consult with neighbours about their planned operation, to explain the reason for their use, and to discuss options for their operation. In some cases this may not be feasible (eg, the number of people involved, uncertainty about who may be able to hear the devices in different conditions, or historic bad relations) but, if possible, it could help prevent some problems from arising.

In cases where a number of properties may all be using gas guns, if it is possible to identify sensible groupings of properties, much could be gained by working collectively as a unit, both in terms of the effectiveness of the devices and their impact on the surrounding community. A multi-property (area) bird management plan could address both rationalising the number of guns to an even distribution over the total area and their discharge rates and timing.

### ***Identifying gas guns and other audible devices***

Local authorities such as councils and police have expressed frustration at identifying the owners of devices, particularly during out-of-hours operation or operation on properties that do not have a site manager or may be unattended for long periods of time.

Operators should ensure there is clear identification displayed on the devices, or at the entry to a property, to enable contact if an authorised officer needs to enter the site.

## Case studies

The following case studies are examples of typical complaint situations and the application of the management guidelines to achieve the performance-based objective.

### Case study 1

A grower operates a gas gun that is approximately 200 m from the nearest residence. Both the grower's property and the residence are in a horticultural zone that promotes the grower's land use.

The gun begins to detonate at sunrise and continues through to sunset, with 10 shots per hour over that period.

A measurement of the noise level from the guns, taken at the residence by the authorised officer investigating a complaint made by the resident, is approximately 100 dB(LinPeak).

The total number of shots during the day is 130 (approximately 13 hours times 10 shots per hour).

The APL is calculated by adding the noise level and the logarithm of the number of shots:

$$\text{APL} = 100 + 10 \log(130) = 121$$

The APL for a receiver in a horticultural zone is 118, and so the grower is substantially in excess of this.

The grower also advises that he does not regularly use any other method of bird management on his property other than the gas gun.

The investigating officer requires the grower, through the issue of an Environment Protection Order under Part 7 of the Noise Policy, to:

- prepare a bird management plan and meet an APL of 118 within a certain timeframe
- restrict the operation of the gun from 7 am to 8 pm on the property, given that it will not achieve the maximum noise level requirement  $L_{\text{Amax}}$  of 45 dB(A) after 8 pm or before 7 am.

While on site, the investigating officer tests the noise level at various distances and advises the grower that by relocating the gas gun to 400 m from the residence and restricting the number of shots to six per hour over 13 hours, the APL of 118 could be achieved.

The grower, in conjunction with an industry representative group, prepares a plan using the outline in these guidelines and discussing best practice management options with the Department of Primary Industry and Resources South Australia.

These investigations provide the grower with a range of options that, if integrated, are expected to improve the effectiveness of the bird scaring program on the property. The plan outlines the range of measures that will be applied.

Implementation of the range of measures results in a reduction in the use of the gun and an APL of 118 being achieved. In addition, the strategy improves the effectiveness of bird scaring on the property.

### Case study 2

The same grower continues to operate using the bird scaring management plan, monitoring its effectiveness over time, and adjusting management options to suit.

As the horticultural zone develops, neighbouring properties develop similar land uses that require bird management programs.

The cumulative effect of the additional growers using gas guns results in an adverse impact on the residential use. This is determined by measuring the number and noise level of the gas gun discharges at the residence.

The investigating officer identifies four properties in the vicinity that contribute to the cumulative impact, including the original grower. Contact is made with the owners of the properties and it is stated that each property must show they can achieve an APL that is 5 dB(A) less than 118, and that they have an effective bird management regime.

The original grower considers this to be an unfair solution given the property's bird management regime and control of gas gun use.

The alternative, in accordance with these guidelines, is for the four growers to coordinate a single approach that meets the performance criteria.

The original grower organises the group and it is found that the other three growers are relying on gas guns alone for bird scaring. The bird management plan used by the original grower is considered by the group and adapted to provide an integrated area bird management plan.

As a result of the plan, the number of audible devices and their discharge rates and timing are rationalised. Further testing at the residence indicates the required APL resulting from the cumulative effect of all four properties is met, and the original grower is able to operate without change.

## GLOSSARY

a-weighted	frequency weighted as specified in <i>Australian Standard AS 1259-1990 Noise Level Meters</i> or its replacement
authorised officer	a person appointed to be an authorised officer under Division 1 of Part 10 of the <i>Environment Protection Act 1993</i>
ambient noise	the total noise in a given environment not including the noise source under investigation
background noise	the ambient noise, measured using time weighting F, that is equalled or exceeded for 90% of the measurement time interval. Expressed as $L_{A90,T}$ , where T refers to the measurement time interval in minutes
dB(A)	the noise level in decibels, obtained using the 'A' weighted network of a noise level meter as specified in Australian Standard AS 1259-1990 Noise Level Meters or its replacement
EPA	South Australian Environment Protection Authority
equivalent noise level	the equivalent continuous A-weighted sound pressure level, obtained using time weighting F, over the measurement time interval. Expressed as $L_{Aeq,T}$ , where T refers to the measurement time interval in minutes
extraneous noise	noise from animals, excessive wind effects, insects, birds, aircraft or unusual traffic conditions, or any other infrequently occurring component of the ambient noise
maximum noise level	the value, expressed in dB(A), of the highest instantaneous noise level using fast time weighting F, expressed as $L_{Amax}$
measurement place	a place at the receiver where the noise level is to be measured.
noise source	premises at which an activity or process is undertaken that results in the emission of noise
premises	any land, or the whole or part of a building or structure

receiver	premises that may be affected by the noise source, other than premises on the same land as the noise source
zone	an area of land delineated as a zone, precinct or otherwise in the relevant Development Plan under the <i>Development Act 1993</i> that is subject to a set of land use rules under that plan

## APPENDIX 1      ACCUMULATED PEAK LEVEL TECHNICAL INFORMATION (APL)

### Accumulated peak level

The study *Community Reaction to Noise from an Artillery Range* found that the APL was the superior measure in relation to estimating the community reaction to a broad range of impulse noise.

The APL is a single number that represents the cumulative effect of the number of shots and their noise levels over the course of a day.

Effectively, it is the logarithmic addition of the noise levels experienced at a receiver over the course of a day.

### The logarithmic scale

Noise is propagated as a local fluctuation in pressure. The eardrum is a thin membrane that vibrates when exposed to this fluctuation. The amplitude of the vibration (level) is interpreted as loudness. The perceived loudness is also dependent on the speed of the vibration (frequency). The frequency of a sound is interpreted as pitch or tone.

Subjectively, a high frequency noise at a given level is interpreted as louder than a low frequency noise of the same level. Noise must therefore be 'weighted' by a sound level meter and microphone to simulate this subjective response.

The microphone incorporates a thin metallic strip, commonly known as a diaphragm, to replicate the function of the ear.

The sound level meter, when operated in A-weighting mode, weights the pressure input (electrical signal) from the microphone to simulate the response of the brain to high and low frequency noise.

The unit for pressure is the Pascal (Pa). This is a measurable physical quantity. However, noise is not represented in this form.

This is because the human ear can interpret (and a sensitive microphone can measure) pressures in the range from effectively 0 Pa to the order of millions of Pa. A scale of the order of millions is impractical to use.

The logarithmic scale condenses larger scales into an order that is manageable by determining how many times the number 10 must be multiplied by itself to make up the number in question.

For example:

- the 'log' of 10 is 1
- the log of 100 is 2
- the log of 1000 is 3
- the log of 1,000,000 is 6.

A scale in Pa that ranges from 0 to a million can be converted to a logarithmic scale that ranges from 0 to 6.

A logarithmic scale, when referenced against the lowest pressure the ear can detect, is expressed in the unit dB.

The most common representation of a noise level reading is seen as dB(A), which indicates it has been converted to a logarithmic scale and has been A-weighted to simulate the human response.

## Addition in the logarithmic scale

The addition of numbers in a logarithmic scale is different to addition in a linear scale because a vast difference in the pressure (in Pa) corresponds to a relatively small difference in dB, as described below:

- A doubling of pressure (from 10,000 to 20,000 Pa) will result in a 3-dB increase
- A tripling of pressure (from 10,000 to 30,000 Pa) will result in a 5-dB increase
- A tenfold increase in pressure (from 10,000 to 100,000 Pa) will result in a 10-dB increase
- A 3-dB increase is subjectively described as 'just noticeable'
- A 5-dB increase is subjectively described as 'noticeable'.

Another way to think of the information above is that, if exposed to a noise source such as an idling truck standing 10 metres away, you would need three of them to clearly notice a change in noise level and 10 of them to make the noise seem twice as loud.

When adding noise levels in dB the following rules apply:

Difference between 2 numbers (dB)	Total noise
0	add 3 to the number to get the total
1	add 3 to the highest number
2	add 2 to the highest number
3	add 2 to the highest number
4 to 9	add 1 to the highest number
10 and above	add 0 to the highest number

For example:

- the total noise from two sources producing 100 dB each is 103 dB
- the total noise from one source at 100 dB and another at 103 dB is 105 dB
- the total noise from one source at 100 dB and another at 110 dB is 110 dB. (This effect is known as 'masking'.)

A way of expressing this addition formula when all **noise sources are at the same level** is by adding  $10 \times \log(N)$  to the base level, where N is the total number of sources.

For example, if you have 6 sources, each producing 100 dB, the total noise can be derived from adding  $10 \times \log(6)$  to 100 (=108). A scientific calculator will provide the answer to  $10 \times \log(6)$  by entering 6, pressing the log key and multiplying the answer by 10.

The same result can be derived by adding each level individually using the tabulated method. For example:

- $100 + 100 = 103$  (adding two of the six noise sources together)
- $103 + 100 = 105$  (adding another noise source to the result)
- $105 + 100 = 106$  (adding another noise source to the result, etc)
- $106 + 100 = 107$
- $107 + 100 = 108$ .

## How does this relate to APL?

The APL is effectively the logarithmic summation of all of the noise levels measured at the receiver during the course of the day.

For example, if an officer measured the following during a day (in practice, this would normally be estimated by inspection during (a) period(s) throughout the day and extrapolated to estimate the APL):

- 1 shot at 110 dB
- 7 shots at 100 dB
- 60 shots at 95 dB,

using the formula  $10 \times \log(N)$  and **logarithmically** adding together each answer to get the total:

$$\begin{aligned}(110 + 10 \times \log(1)) + (100 + 10 \times \log(7)) + (95 + 10 \times \log(60)) &= 110 + 108 + 112 \\ &= 112 + 112 = 115\end{aligned}$$

It can be seen that the above method accounts for the effect of the number of shots and not just the level of those shots.

The logarithmic scale means that you need a substantial increase in the number of shots to make a difference to the APL. Intuitively this makes sense because you would expect that a person exposed to 60 shots would have a similar reaction when exposed to 80 shots in that day. However, their reaction would be expected to change if they were exposed to 800 shots.

For example:

- $10 \times \log(60) = 18$
- $10 \times \log(80) = 19$  (no noticeable difference)
- $10 \times \log(800) = 29$  (twice as loud).

The other thing to notice about the APL is that the noise level provides the biggest influence on it. Therefore, a gas gun deemed to be excessive will be more easily reduced to a satisfactory APL by reducing its noise level by shielding, rotation and/or relocation than by reducing its number of shots.

### **Why is the APL expressed as dB (LinPeak)?**

The study, Community Reaction to Noise from an Artillery Range, found that the unweighted peak level was acceptable as a measure of impulse noise.

'Unweighted' means the result has not been adjusted to account for the subjective response of humans to sounds of varying frequency. This is referred to as the Linear (or 'Lin') scale.

The 'peak' refers to measurement of the absolute level prior to mathematical manipulation by the meter.

LinPeak can therefore be thought of as a descriptor that captures the actual impulse without modification.

The most common descriptor for other types of noise would average the pressure levels received by the meter and apply the A-weighting network to the result. This has been found to be a less reliable descriptor in predicting the human response to impulse noise, as would be intuitively expected.

### **How would the APL be applied?**

A value of APL responds to an expected percentage of the community being 'seriously affected'.

Environmental policy generally accepts a percentage of 10% seriously affected, rather than no effect at all, to account for economic and technical considerations, and the large variation in individual responses to a given environmental nuisance issue.

This balance changes according to the location of the receiver. It is well accepted that the greatest level of protection should be afforded to a resident in a residential zone. The 10%-rule would apply in this situation.

A resident located within a horticultural zone will have a different balance, with economic factors for the horticulturist providing more weight in this situation.

A resident located at the interface of a horticultural zone will have a different balance or amenity again. The general philosophy is that both the horticulturist and the resident will need to make equal compromises in this situation.

The APL for the existing EPA guidelines of 6 shots per hour at 100 dB (LinPeak) over a 10-hour day is  $100 + 10 \log(10 \times 6) = 118$ .

An APL of 118 corresponds to 30% seriously affected. This level of effect would only be considered acceptable for a resident located in a primary production zone; the balance in this situation falls with the primary producer.

The APL that corresponds to 10% seriously affected is approximately 112.

Therefore, the APL that would be applied at the interface of these two land uses is derived from an equal compromise (halfway between 118 and 112 = 115).

The Maximum APL provided in Table 1 of these guidelines therefore becomes 118 for a noise-sensitive receiver in a primary production zone, and 115 for a noise-sensitive receiver in a residential zone that interfaces with a primary production zone.

### **What are the advantages of using the APL?**

- It has a solid technical basis.
- It provides ultimate flexibility for the horticulturist while protecting the surrounding community.
- It better reflects the real impact and the real use of the devices.
- It accounts for the cumulative impact of a number of devices or properties.
- It consolidates a number of different rules into a single number approach.
- What are the disadvantages of using the APL?
- It will require some additional training for the investigating officers.
- It may be difficult for the broader community to get an intuitive feel for it.

### **How about the cumulative effect of multiple guns from multiple properties?**

The APL can be calculated for the noise from multiple gas guns on a single property.

Where multiple properties exist that impact on a receiver, it may be difficult to identify the property from which the sound is emanating but an overall APL can be determined.

If that APL exceeds the relevant level, an adverse impact on that receiver can occur. These guidelines require all persons contributing to that impact to prevent or minimise their contribution in accordance with the general environmental duty.

## APPENDIX 2 BIRD MANAGEMENT PLAN OUTLINE

Bird management plans for individual properties should offer sufficient information to allow the property owner to make an informed decision on dealing with bird problems. The type of information and the level of detail required will vary according to the nature and scale of the problem.

The following checklist provides an indication of the type of information that may need to be collected to assist growers to write their own bird management plans.

More detailed information for growers, especially on options for management actions, can be found in *Guidelines for Best Practice Bird Management*<sup>4</sup>.

### Property map

A property map should be prepared, detailing:

- different crops
- varietal blocks
- surrounding vegetation
- features around the property such as:
  - powerlines
  - roads
  - dams
  - other watering points.
- sensitive areas such as:
  - your house(s)
  - neighbours' houses
  - nearby townships
  - horse stables.

### Bird problem

The following information should be prepared and marked on the property map.

#### *Where damage occurs*

Identify where damage occurs on the property:

- bird flight paths
- areas often frequented by birds
- areas of high human activity
- alternative potential feed
- alternative feeding sites.

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<sup>4</sup> Sinclair, R 2003, *Guidelines for Best Practice Bird Management*, Department of Water, Land and Biodiversity Conservation, Adelaide.

***Which species cause damage***

List the pest species known to visit your property.

Determine an order of importance for each species based on damage caused.

Determine which species are causing damage in which crop/variety block.

Determine a pattern of presence for each species:

- those present most of the year (locals)
- those present as the crop ripens (visitors)
- those present at other specific times.

***When damage occurs***

Record the expected harvest dates for each crop/variety block.

Record when damage starts.

Compare the data to previous years to establish any patterns.

***Cost of bird damage to the property***

You should have two components:

- record(s) from previous years' experience
- an ongoing record of what is happening through the current year/season.

For each year estimate the following:

- the amount of crop lost due to birds, as a percentage of total crop
- the value of crop lost due to birds, as a dollar value
- the level of reduced quality of fruit that has occurred.

For each year estimate the cost of bird control activities:

- initial set-up cost of equipment
- annual depreciation costs of capital equipment
- consumable items (fuel, ammunition, etc)
- labour.

Add the above sub-totals together to achieve an annual cost to the business.

***Management resources***

List the devices you intend to use:

- visual scarers (eg hawk-kites, scarecrows, plastic bags on poles, streamers)
- noise scarers (eg firearms, gas guns, electronic bird scarers)
- noise and movement (eg motor bike without a muffler, model or real aircraft)
- exclusion (netting)
- habitat management (eg decoy feeding, strategic mowing, irrigation)
- culling.

## ***Management strategies***

The following information should be recorded as part of the plan:

### **Aims**

State the aim(s) you seek to achieve, eg:

- a reduction in the loss of crop
- an increase in yield
- a reduction in current control costs.

### **Management actions**

Briefly describe what you intend to do to achieve your aim(s), for example:

- how you intend to manage the main pest species (as listed above)
- when you intend to manage the problem
- where you intend to manage the problem.

Prepare approaches for both local and visitor species detailing:

- the variety of management resources you are going to use
- the actions you are going to implement to maintain the ongoing effectiveness of each resource.

### **Monitoring**

Document the monitoring of:

- each management resource that you have used
- each action plan you have implemented
- what needs to be done to improve the effectiveness of both the resource and the action plan.

Monitoring records could include:

- an estimate of loss from the same place(s) within the crop on regular occasions throughout the season/period
- a regular estimate of the number and species of birds feeding on the crop at a particular time of the day.

### **Communications**

The following information should be recorded as part of the plan:

- List of neighbours on your property boundaries and contact details.
- List of other sensitive receptors, eg, schools, hospitals, churches.
- Determine what information you will supply to your neighbours:
  - name(s) of owners/managers
  - contact details including mobile and after hours phone numbers.

List what action you intend to take to notify your neighbours:

- prior to the commencement of the season
- during the season

- when there are unusual circumstances.

List the method of communication you intend to use, eg:

- phone call
- fax/email
- personal visit
- letterbox drop.

List what action you or your staff **will** implement as a result of a complaint by a neighbour.

Record what action you **did** undertake on receiving a complaint from a neighbour.