

DISCUSSION PAPER

REVIEW OF NATIONAL CODE OF PRACTICE FOR THE HUMANE SHOOTING OF KANGAROOS

**PREPARED BY THE NRMCMC WORKING GROUP
June 2004**

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Call for submissions on the review of the *Code of Practice for the Humane Shooting of Kangaroos.*

WHAT IS THE *CODE OF PRACTICE FOR THE HUMANE SHOOTING OF KANGAROOS?*

The Code of Practice for the Humane Shooting of Kangaroos was produced to ensure that all persons intending to shoot free-living kangaroos were aware of the welfare aspects pertinent to that activity. All shooting of kangaroos, whether on public or private land, is subject to law. The laws may differ between localities and the Government Wildlife Authority in the state or territory in which the shooting will occur will require the shooter to have a licence or permit issued by the Government Wildlife Authority and this Authority will specify any conditions or restrictions applying to that licence or permit.

A copy of the current Code of Practice can be obtained at <http://www.deh.gov.au/biodiversity/trade-use/publications/kangaroo-report/cop.html>

The Code of Practice has a number of sections including;

- An Introduction;
- A section on methods of shooting kangaroos;
- A section concerning how injured kangaroos and pouch young are to be dealt with;
- A section on shooting for scientific purposes; and
- Three Schedules setting out –
 - - the minimum specifications for firearms and ammunition
 - - the point of aim for a shot to the brain (all kangaroos)
 - - the point of aim for a shot to the heart (applicable only as described for injured kangaroos and specified for shotguns).

WHY DO WE NEED TO REVIEW THE CURRENT CODE OF PRACTICE?

In 1999 the Australian Department of the Environment and Heritage (DEH) commissioned the Royal Society for the Prevention of Cruelty to Animals (RSPCA) Australia to conduct a survey of compliance with the Code within the commercial kangaroo industry. This survey was a repeat of a survey first conducted in 1985. The aim of the survey was to assist the federal and State governments to determine if additional measures are required to ensure compliance with the Code. RSPCA Australia produced a report, titled *Kangaroo Shooting Code Compliance: A Survey of the Extent of Compliance with the Requirements of the Code of Practice for the Humane Shooting of Kangaroos* which was published by the DEH in July 2002. A copy of the report can be viewed at

<http://www.deh.gov.au/biodiversity/trade-use/publications/kangaroo-report/index.html>.

Following the completion of the survey a submission was made to the Natural Resource Management Ministerial Council (NRMMC) in which the findings of the survey were reported and a recommendation was made that consideration be given to reviewing the

Code of Practice in light of the findings of the RSPCA Australia report and to also consider any other matters that may warrant changing. The NRMCC resolved to establish a working group to review the current Code of Practice, and set out terms of reference, membership and a timeline for the working group. The aim of the working group would be to produce a third edition of the Code, should it be required. Any proposed revisions to the Code of Practice would need to be assessed for both their animal welfare outcomes and the ability of the industry to implement the changes. The working group would undertake public consultation throughout the revision of the Code.

The Working Group met for the first time in Perth in September 2003 and discussed a number of issues, including those raised in the RSPCA Australia report. Before any consideration is made to re-writing the Code of Practice the Working Group has prepared a **Discussion Paper** for public comment.

Members of the public, government agencies and non-government groups are all welcome to provide comments on any of the issues raised in the Discussion Paper, or any other issue that they consider relevant to the humane shooting of kangaroos and that are not raised in the Discussion Paper.

WHAT DO YOU THINK?

The Working Group wants to know what you think about issues raised in the Discussion Paper or any other issue relevant to the terms of reference of the Working Group.

PREPARING A SUBMISSION?

It is an opportunity to provide information, express your opinion, suggest alternatives and have your say on the current Code of Practice and provide comment as to whether you believe the Code should be revised or not.

If you prefer not to write your own submission you could make a joint submission with others.

WHAT MAKES AN EFFECTIVE SUBMISSION?

To ensure your submission is as effective as possible:

- Make it concise and clear.
- List your points according to the subject sections (and page numbers) in the current Code of Practice.
- Describe briefly each subject or issue you wish to discuss.
- Say whether you agree or disagree with any or all of the issues raised in the Discussion Paper or just those of specific interest to you; clearly state your reasons (particularly if you disagree) and give sources of information where possible that will help the Working Group better understand your point of view.
- Suggest alternatives to deal with any issue with which you may disagree.

It is important to indicate those issues in the Discussion Paper that you agree with as well as those with which you disagree.

Each submission is important in its own right but those that give reasons for concerns, give support where appropriate and offer information and constructive suggestions are most useful.

WHAT HAPPENS TO YOUR SUBMISSION?

All submissions will be summarized according to the topics raised. The Working Group will then review the issues set out in the Discussion Paper in light of the public submissions, according to established criteria (see below). A summary of the submissions will be provided to the NRMMC along with any recommendations for changes (or not) to the existing Code of Practice.

If the Working Group, with the benefit of the public comments, is of the view that the current Code of Practice should be revised then a draft revised Code will be prepared. The NRMMC has indicated that should there be a need to revise the Code of Practice, any draft prepared should also be put out for public comment. As such the general public will have a second opportunity to make comment. Once the second round of public comments has been received the Working Group will refine the draft revised Code of Practice and this will then be submitted to the NRMMC for their consideration.

A request that a submission be regarded as ‘CONFIDENTIAL’ will be considered but not necessarily granted. If granted, the author will remain anonymous in the summary of submission. If not granted, the author will be notified and the author may withdraw the submission. Designation of a submission as confidential will not necessarily guarantee that the document will be exempt from disclosure under freedom of information legislation.

WHAT CRITERIA WILL BE USED IN ASSESSING YOUR SUBMISSION?

All submissions will be considered.

1. Your views may be included in any revised Code if the submission you make:
 - (a) provides a clear case for the need to amend, correct or incorporate new material not currently contained in the current Code.

2. Your views may *not* be incorporated into any revised Code if the submission you make:
 - (a) does not provide a clear case for the need to amend, correct or incorporate new material not currently contained in the current Code;
 - (b) offers a neutral statement or no change is sought;
 - (c) addresses issues beyond the scope and terms of reference of the Working Group (e.g. That the shooting of kangaroos should cease altogether.);
 - (d) makes points that are already in the Code of Practice;
 - (e) is one amongst several widely divergent view points received on the topic and the recommendations in the current Code of Practice are still considered the best option;
 - (f) contributes options that are not possible (generally due to some aspect of existing legislation or that are technically not feasible or could not be reasonably and safely applied in the field by kangaroo shooters or another code is as effective or more so.).

DEADLINE

Submissions are welcome for eight (8) weeks and submissions will not be accepted after the Close of Business on Friday 15th October 2004.

For enquiries please telephone (08) 9334 0421.

WHERE DO YOU SEND YOUR SUBMISSION?

The Chair of the Working Group is employed by the Western Australian Department of Conservation and Land Management.

Written submissions should be sent to:

**Executive Director
Department of Conservation and Land Management
Locked Bag 104
BENTLEY DELIVERY CENTRE WA 6983**

Attention: Senior Zoologist, Wildlife Branch

DISCUSSION PAPER

BACKGROUND

What is the Code of Practice for the Humane Shooting of Kangaroos?

The Code of Practice for the Humane Shooting of Kangaroos (hereafter referred to as “the Code”) has been developed to set an achievable standard of humane conduct and is the minimum standard required by persons shooting kangaroos. It is intended that the Code be implemented through education and State and Territory legislation as appropriate. The Code is based on the knowledge and technology available at the time of publication and it was recognized that there may be a need to vary the Code in light of new knowledge.

The Code was endorsed by the Council of Nature Conservation Ministers (CONCOM) that comprised all Commonwealth, State and Territory Ministers having responsibility for national parks and wildlife. In July 1991 the CONCOM was amalgamated with the Australian and New Zealand Environment Council to form the Australian and New Zealand Environment and Conservation Council (ANZECC). The Code was first published in 1985 with a second edition published in 1990, and reprinted in 1995 and again in 1998.

A copy of the current Code can be viewed at

<http://www.deh.gov.au/biodiversity/trade-use/publications/kangaroo-report/cop.html>.

In 1985 RSPCA Australia prepared a report for the then Australian National Parks and Wildlife Service on the incidence of cruelty to kangaroos [titled *Incidence of Cruelty to Kangaroos*. Report to the Australian National Parks and Wildlife Service. RSPCA Australia (1985)]. This report was prepared prior to the first version of the Code of Practice for the Humane Shooting of Kangaroos being implemented. In 1999 the Commonwealth Department of the Environment and Heritage (DEH) again commissioned the Royal Society for the Prevention of Cruelty to Animals (RSPCA) Australia to conduct a survey of the level of compliance with the Code within the commercial kangaroo industry. The aim of the survey was to assist the Commonwealth and State governments to determine if additional measures were required to ensure compliance with the Code. RSPCA Australia produced a report, titled *Kangaroo Shooting Code Compliance: A Survey of the Extent of Compliance with the Requirements of the Code of Practice for the Humane Shooting of Kangaroos* which was published by the DEH in July 2002. A copy of the report can be viewed at

<http://www.deh.gov.au/biodiversity/trade-use/publications/kangaroo-report/index.html>.

Why is the Code Being Reviewed?

Animal welfare requirements have recently been incorporated into the Commonwealth legislation regulating the export of kangaroo products. Under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act), a wildlife trade management plan to export kangaroo products may only be approved if the animals are killed in a way which is generally accepted to minimize pain and suffering.

At the 11 October 2002 meeting of the Natural Resource Management Ministerial Council (NRMMC) a resolution was passed calling for a review of the current Code. The current Code applies to both commercial and non-commercial shooting, and one of the issues raised in the RSPCA Australia report was the regulation of, and capacity to enforce the Code in, non-commercial shooting of kangaroos.

Who is Conducting the Review of the Code?

The NRMMC resolved to establish a working group to review the current Code, and set out terms of reference, membership and a timeline for the working group (Appendix A). The aim of the working group would be to produce a third edition of the Code, should it be required. Any proposed revisions to the Code would need to be assessed for both their animal welfare outcomes and the ability of the industry to implement the changes. The working group would undertake public consultation throughout the revision of the Code. The membership of the working group was to include a professional kangaroo shooter representative and a member of the Primary Industry Standing Committee (PISC) Animal Welfare Committee.

The NRMMC Working Group met for the first time on 19 September 2003 in Perth. The membership of the Working Group (at 19 September 2003) is set out in Appendix B.

The Working Group identified areas where issues relating to the possible need to revise the Code arose. These fell into two main areas with the first being issues that are now out of date in the existing Code, along with errors, anomalies or inconsistencies therein. The second area concerns issues identified within the RSPCA report published by the DEH in 2002. Not surprisingly, several of the issues were common to both areas.

WHAT ASPECTS OF THE EXISTING CODE MIGHT NEED REVISING?

Section 1

Matters Relating to the Existing Code

- The Working Group identified a number of issues relating to the existing Code that may warrant changing.

Detailed discussion of each of these issues is provided below.

1.1 Title of the Code

While the term 'kangaroo' is defined in the Code in the first paragraph of the Introduction as "all species of the family Macropodidae within the superfamily Macropodoidea", the Working Group is concerned that there is the potential for confusion or misconception amongst the public with regard to the application of the Code. The Code is intended to cover a range of species that are typically referred to by a number of different generic or common names such as *kangaroo*, *wallaroo*, *euro*, *wallaby* and *pademelon* and there may be better terminology that can more clearly convey the intent of the Code.

The Code is designed primarily, but not exclusively, to cover the commercial shooting of kangaroos in accordance with management plans approved by the Commonwealth Minister for the Environment and Heritage. The four larger species of kangaroo and one wallaby species may be taken commercially under management plans prepared by the States of Queensland, New South Wales, South Australia and Western Australia. The notion of ‘shooting’ *per se* includes non-commercial shooting for mitigation of damage to crops and pasture and also recreational shooting, where this is permitted. There may be a need to clearly differentiate between commercial and non-commercial shooting and to reflect this in some manner in the title of a revised Code.

1.2 Layout and Format

a) The Working Group noted that some issues first raised in the Introduction of the current Code are repeated in later sections of the Code but use different terminology or phrasing. Any revised Code should make it clear what is required and what is simply background information, and terminology used throughout the document should be consistent.

b) The Working Group also noted that people currently involved in the commercial kangaroo industry, farmers or members of the community who might engage in the shooting of kangaroos will have varying levels of literacy. If the messages set out in the Code are to reach all of those people involved in the shooting of kangaroos then there would be benefits in providing the material in a range of formats including CD, video, DVD and even audio tape (in conjunction with the written copy since it currently includes diagrams). Providing the Code in such a range of formats could also contribute to the broader use of the material for educational purposes by other stakeholder groups within the community. To achieve delivery of the Code in a wider range of formats would require additional funding above the costs of simply reprinting a ‘booklet’ style Code.

c) The diagrams in Schedule 2 and 3 of the Code are basic and the Working Group considered that there could be some benefit in redrawing these figures to show not only the recommended point of aim, but also how large an area the brain and heart occupy relative to the point of aim. This would reinforce the need for shooters to be competent at hitting a relatively small effective target, since only a shot delivered to the brain or heart will deliver a quick and painless death.

1.3 Shooting for Scientific Purposes

The Working Group considered the section in the Code titled “Shooting for Scientific Purposes”. The State conservation agency representatives on the Working Group confirmed that each of those States already had existing legislative provisions that covered the taking of native wildlife for scientific purposes. Such provisions are standard across all States and Territories and where the materials collected are exported they are also covered in the *EPBC Act*. As such it is considered no longer necessary to retain this section of the Code, although it would be beneficial to include a paragraph in any revised Code explaining how the process of shooting kangaroos

for scientific purposes is catered for under the various State and Territory wildlife legislation.

1.4 Competency and Compliance

"Competence" is the ability of the person(s) bound by the Code to meet its provisions. For example; is the shooter physically capable of aiming and firing their firearm with sufficient accuracy to consistently achieve single brain or heart shot kills? This can be determined *in advance* of any licence being issued via a proficiency test. Proficiency tests are already required in Queensland, New South Wales and South Australia, and will become mandatory in Western Australia in the near future.

"Compliance" is the extent to which the person(s) bound by the Code actually meet its provisions. A competent person may still fail to comply with the Code, making compliance a matter of attitude, not ability. Conversely, a well-intentioned person who is not competent will also fail to comply with the Code due to a lack of ability. Compliance *cannot be tested in advance* of a licence being granted, however it can be evaluated by the regulatory body through inspection of carcasses, vehicles and premises and need not be included in any revision of the Code.

The Working Group also considered the section of the Code under the heading "Method of Shooting". The humaneness of shooting into scrub, particularly when targeting smaller kangaroos and wallabies, was questioned due to the reduced visibility and possibility of the projectiles being deflected and losing sufficient momentum to prevent them achieving a quick and painless death. The current wording is designed to accommodate the full range of circumstances under which kangaroos and wallabies are shot (i.e. commercial, non-commercial damage mitigation and recreational shooting) and the different behaviour of kangaroos and wallabies.

While the current Code makes reference to the need for any shooting of kangaroos to comply with the relevant State or Territory laws, no specific reference is made to the need for shooters to achieve a minimum standard of competency in the use of their firearms. All of the four States with approved Commonwealth Management Plans for the commercial harvest of kangaroos already require, or will require during the life of the current plans, commercial kangaroo shooters to be accredited with regard to their competency to use the prescribed firearms. All State management plans include a requirement for compliance with firearms standards for commercial shooting of kangaroos. The difference between the issue of competency and compliance is important, and only one of them (i.e. competency) should be addressed in the Code. The other is a matter for the relevant State or Territory conservation agencies.

There can be no doubt that whether the animal is shot for commercial or non-commercial purposes the same minimum standard should apply. However, care needs to be taken to ensure that whatever minimum standards are applied can be reasonably achieved by the majority of shooters while still ensuring any kangaroos shot have quick and painless deaths. The Working Group considers that if standards

are set so high that many shooters are unable to reach the required benchmarks this may lead to some shooters, particularly non-commercial shooters, ignoring minimum standards of competency established in the Code, creating significant compliance issues for the relevant authorities.

1.5 Firearms

The use of shotguns for the killing of certain species of kangaroos is currently endorsed in the Code (see the Table in Schedule 1 of the Code), with a minimum specification of 12 gauge shotguns or larger, using No. 2, 1 or BB or larger shot size. The maximum recommended range for the use of shotguns to shoot kangaroos is 20 metres. Shotgun cartridges must be loaded to provide a dense and random pattern (e.g. 12 gauge cartridge requires a shot load no less than 36g=1.25 oz = 63 BB shot pellets). The Working Group considers that the use of shotguns is controversial in some quarters and warrants review.

Shotguns are not permitted for the shooting of kangaroos taken as part of the commercial harvest in the four States with approved management plans for kangaroos. As such the issue of shotguns only relates to non-commercial shooting for damage mitigation and recreational shooting of smaller macropod species, and even then only in some States or Territories.

The following information was gathered from wildlife staff in all States and Territories. The survey canvassed the following issues:

- the extent of use of shotguns for taking macropods; and
- the likely impacts of removing shotguns from the Code.

In most States the use of shotguns for taking macropods was reported as being minor although staff in wildlife agencies did not have data on the level of use of shotguns. The Working Group considered what impact any change to the Code to disallow shotguns may have on current shooting activities in each State.

Table 1. Summary of the use of shotguns for the shooting of kangaroos and wallabies in Australian States and Territories, and the likely impact on those activities should the use of shotguns be excluded from a revised Code.

Jurisdiction	Extent of use of shotguns	Implications of changes
Tasmania	Very High	Significant
South Australia	Very low	Minor
Western Australia	Very low	Insignificant
New South Wales	Very low	Minor
Queensland	Very low	Minor
Victoria	None	None
Northern Territory	Negligible	None
ACT	None	None

Tasmania

While there are no management plans approved to enable the export of macropods, Tasmania commercially harvests macropods for the domestic market. Commercial shooters can use centrefire and rimfire rifles. Shotguns are not used in the commercial macropod harvest. However, recreational hunters are a major means of providing crop protection and these hunters do use shotguns.

Tasmania has its own code of practice for shooting (<http://www.dpiwe.tas.gov.au/inter.nsf/Attachments/CPAS-5TE4Y9?open>). The Tasmanian standard allows wallabies to be shot with shotguns, centrefire and rimfire rifles. There are differences between the national and State Codes with respect to firearms, shot size and projectile specifications. The State has committed to phasing out the use of the toxic 1080 baits for crop damage mitigation over the next decade and shooting will play a major role in future crop protection practices. Without the recreational shooters, the fall back positions in the phasing out of 1080 are currently limited. Tasmania has an organised game management program where wildlife officers assist with the development of property management programs and manage the crop protection shooting permits. In 2002 around 7,000 permits were issued, so the use of shotguns is a significant practice.

Any changes to the Code that reduce the use of shotguns would impact on this non-commercial crop protection cull significantly.

South Australia

Damage mitigation permits are issued for Tammar wallabies (*Macropus eugenii*) on Kangaroo Island. Under the current Code, shotguns or centrefire rifles may be used to take these animals. It is not known what proportion of Tammar wallabies are currently taken with shotguns.

Western Australia

All kangaroos (two species) going into commercial trade must be taken with center-fire firearms. Licences are available for damage mitigation culling for three species using licenced firearms, including shotguns, but shooters must comply with the Code. No small wallaby species are taken under damage mitigation permits. A change to the Code would have limited impact on macropod management in Western Australia.

Queensland

Shotguns are not permitted for damage mitigation control of any macropod species in Queensland. A standard condition of permits requires the use of a centrefire rifle in accordance with the Code.

New South Wales

Shotguns are not permitted for commercial harvest of kangaroos and in the western zone, where the commercial harvest occurs, there is negligible or no use of shotguns. Officers are unaware of any significant use of shotguns in the eastern areas, but if it

does occur it is likely to be uncommon. Shotgun use is considered to be minor and the implications of any changes to the Code would be negligible.

Victoria

There is no use of shotguns for macropod control in Victoria. Damage mitigation culling is limited to centrefire rifles so any changes to the Code would not affect Victoria.

Northern Territory

There is some damage mitigation take of Agile wallabies (*Macropus agilis*) in the Top End but there is no evidence of shotgun use.

ACT

Most damage mitigation involves Eastern grey kangaroos (*M. giganteus*) and the ACT does not allow the use of shotguns for shooting of large kangaroos.

Summary

The data presented above indicates that shotguns are not used in any commercial harvest and, with the exception of Tasmania, all commercial harvest of kangaroos is done with centrefire rifles. In relation to the commercial harvest the deletion of shotguns from the Code would not be difficult to implement. However, situation is different in regards to the non-commercial harvest, in particular in Tasmania, where there is significant use of shotguns. The Tasmanian situation is clearly different since the target species are small wallabies (Bennetts wallaby *M. rufogriseus* and Tasmanian pademelon *Thylogale billardieri*). Tasmania has argued that the humane shooting of such small macropods can be achieved with shotguns and rimfire rifles under appropriate circumstances.

1.6 Commercial versus Non-commercial Shooting of Kangaroos

The existing Code covers both commercial and non-commercial shooting of kangaroos but there is no clear separation of the two forms of shooting or any indication of differences in competencies between the two types of shooters. Professional commercial shooters generally operate to a higher standard by virtue of the fact that they have more experience, and as conditions of their licences can only sell carcasses of animals that have been shot in the head or heart, can only use center-fire rifles and cannot use shotguns. The Working Group suggests that the specifications in a revised code should clearly stipulate the separate requirements for commercial and non-commercial shooting of kangaroos and wallabies if there is a requirement to maintain any difference in standards. If the use of shotguns during non-commercial damage mitigation activities was no longer required or supported in the Code shotguns can only be used for smaller wallabies. If shotguns are left in the Code then the Code could be revised to clearly differentiate between the commercial harvest activities (no shotguns) and damage mitigation/non-commercial harvest.

1.7 Humane Killing

a) Head Shot versus Brain Shot

The Working Group was of the view that the definition provided in the Code for a 'head shot' needs to be redefined since the real intention of shooting is to hit the brain and not just the head of the target animal. Better diagrams (see Figures in Schedule 2 of the Code) need to be developed that show a cross-section of the head and indicate where the brain is located and the preferred point of aim and point of contact by the projectile within that area.

b) Euthanasia of Pouch Young and Young-at-foot

One of the likely outcomes of shooting kangaroos and wallabies is that adult females will be taken, some of which may have joeys in the pouch or dependent young-at-foot. The current Code includes a section on "Injured Kangaroos and Pouch Young". There are clear instructions provided on what action must be taken when a female has been killed, including the searching of the pouch for young and the immediate killing of those young, by decapitation or a heavy blow to the skull to destroy the brain, or shooting. However, the Code does not provide any guidance for the humane destruction of young-at-foot.

The Working Group discussed what range of alternative techniques were available for the euthanasia of pouch young and young-at-foot (e.g. decapitation, captive bolt-gun, barbituates) and how readily each of those techniques could be implemented by kangaroo shooters in the field.

It was recognized that the section in the existing code dealing with this issue could possibly be improved. Specifically, it may be possible to describe particular techniques that are more appropriate than others for pouch young of particular age groups (i.e. un-furred pouch young, furred pouch young, pouch young with harder pads on their feet indicating considerable time spent out of the pouch and young-at-foot). It would also be important to ensure that whatever techniques are specified can be applied routinely and humanely without creating occupational health and safety issues for the people involved in shooting the kangaroos.

The question of shooters transferring joeys to wildlife carers was also discussed. It was agreed that this practice is not appropriate as it simply hands the responsibility on to a third party, making it more difficult for relevant authorities or animal welfare inspectors to ensure the humane treatment (including euthanasia) of joeys in the possession of the shooters and any subsequent wildlife carers.

1.8 Ballistics

The Working Group discussed the information provided in the Table in Schedule 1 of the current Code. For some time now some of the State agencies have been concerned about the ballistics specifications in the code, specifically that the specification for the powder load for the .222 Remington was excessive and potentially unsafe in some circumstances. The Queensland wildlife authorities have

now taken the action of specifying a lower powder charge to ensure that kangaroo shooter safety is not compromised by 'hot' loads.

The load specifications in the original Code were based on expert advice from then CSIRO Wildlife Research staff involved in preparing shot loads for taking wildlife. The load for a .222 Remington was set at the maximum permissible for that firearm to provide for surety of a humane kill with the minimum calibre centrefire rifle recommended. While lower loads were acknowledged as capable of producing humane kills in all standard circumstances, the maximum load was considered to provide greater certainty. The ballistics data was also referred to the Australian Federal Police, who at that time endorsed the recommendations.

The Working Group members considered that the shot load specifications for .222 Remingtons should be reviewed in light of modern ballistics information to ensure that they are safe for all shooters while still ensuring sufficient impact force to achieve humane death of the target animals.

The Power Index Ratio (PIR) [see Matunas, E. A. (1984) Rating Handgun Power. *Gun Digest*] allows the user to work out what a given projectile weight travelling at a given velocity will effectively kill at various ranges.

The formula is

$$\text{PIR} = (\text{V}^2 \times \text{ETV} \times \text{Bg} / 12111) \times \text{DV}$$

where ...

V = velocity at target range (ft/sec)

ETV = an Energy Transfer Value [Bullets that are designed to expand, as specified in the Code have an ETV of 0.0100]

Bg = projectile weight (grains)

DV = bullet Diameter Value [Bullets with a diameter in the range of 0.200 to 0.249 inches, as specified in the Code, have a DV = 0.8]

This formula will then give a PIR value for a particular cartridge load. This formula is used worldwide.

It is considered that a PIR value of 200 or greater would result in an instantaneous death to a thin-skinned game animal such as a kangaroo with a well-placed shot to the head/brain or heart.

A .222 Remington has a PIR value of 200 at a range of 100m with a muzzle velocity of 2910 feet/second using a 50gr projectile.

It should also be noted that a PIR of 199.5 should be rounded to the next whole number (e.g. PIR=200). This is considered to be why a muzzle velocity of 2900

feet/sec has been recommended. It logically follows that any calibre greater than .222 Remington (e.g. .22/250, .223) providing their muzzle velocities were 2900 feet/sec or greater would have a PIR of 200 or greater at 100m since the projectile weight would be the same or greater, resulting in an increased PIR value.

When this form of analysis is applied to rimfire rifles and shotguns it is very clear that the PIR values obtained are much lower. For example a .22 LR rimfire rifle with a 40gr projectile has a muzzle velocity of 1120 ft/s. This gives a PIR value of only 33.1. A .22 magnum with a 40gr projectile has a muzzle velocity of 1910 ft/s and a PIR value of 96.4. Projectile velocity decreases with increasing distance from the muzzle, resulting in a corresponding decrease in PIR.

The situation with shotguns is different because of the influence of the greater number of projectiles, as each individual projectile will acquire a smaller amount of energy as a function of its smaller mass. It is not appropriate to apply the PIR equation to shotgun charges. The combined energy of each shot from a shotgun may equal that of a rimfire or centrefire shot but it is rare for more than a few shotgun pellets to actually cause the fatal injury. Many miss the target altogether because of the spread of the shot, and others hit the target but do not inflict fatal injuries. At close range, the pellets essentially act as one mass, and a typical shotgun shell would give the mass of pellets a muzzle velocity of 1300 ft/s and Kinetic Energy (KE) of 2100 ft/lb. If the energy is divided between the pellets, it can be seen that fewer, larger pellets will carry more KE, but the spread may carry them away from the target. Pellets, being spherical, are poor projectiles, and most small pellets will not penetrate skin after 80 yards. Thus, close range wounds are severe, but at even relatively short distances, wounding may be minimal. Range is the most important factor.

Clearly there are significant differences in the momentum that centrefire rifle projectiles deliver compared to rimfire rifles and shotguns. The fact that the lower-powered firearms are used successfully to shoot wallabies suggests that there may be a case for their continued use. However, the Working Group was of the view that there was a good case for this issue to be examined by way of research to verify how effective the lower powered firearms actually are and what their maximum effective range is.

It was also noted that there is a minor error in the current specification in one of the conversions for muzzle velocity from m/sec to ft/sec and that will need to be corrected if it is to be retained in a revised code.

2. *Matters Relating to the RSPCA Report(2002)*

The RSPCA Australia report identified issues relating to

- compliance/training of professional kangaroo shooters;
- projectile types used by shooters;
- the use of shotguns to shoot kangaroos;
- humane euthanasia of pouch young; and

- not shooting females as a means of avoiding having to euthanase pouch young.

The first four issues identified in the RSPCA Australia report have been dealt with in the first section of this Discussion Paper, leaving only the issue of not shooting females as a means of avoiding having to euthanase pouch young.

2.1 Male-only Kangaroo Harvests

In the RSPCA Australia (2000) report the position was put that the only solution which could avoid the potential of cruelty to pouch young would be to avoid shooting females altogether.

The NRMCC made it clear in the documentation accompanying its resolution that any proposed revisions to the Code would need to be assessed for both their animal welfare outcomes and the ability of the industry to implement the changes. The Working Group discussed the issue of whether it would be possible for kangaroo shooters to reliably identify the sex of kangaroos in the field at night, at distances as great as 200m and in situations with varying amounts of vegetation or crops obscuring a clear view of the lower body of the kangaroo. The Working Group also noted that while professional kangaroo shooters may be expected to preferentially shoot male kangaroos since the larger males generated a better return for effort, the harvests are not always heavily male biased. It was noted by the Working Group that as control of local kangaroo populations to reduce damage to crops and grazing pressure on pasture is often one of the aims of a shooting program, the removal of female kangaroos is a necessary part of fulfilling that objective. This is because of the promiscuous mating systems that macropods employ, with few males required in a population to fertilize many females.

The Working Group acknowledged that the preferential shooting of male kangaroos would reduce the need to deal with pouch young of shot females. However, regardless of the emphasis that might be placed on shooting males, female kangaroos will need to be shot to meet the goals of both commercial harvest and damage mitigation and some of these animals will have pouch young. Accordingly, the Code will need to contain clear directions for shooters as to how they should conduct themselves under those circumstances.

Appendix A

Details of the Proposed Working Group to Review the Code of Practice for the Humane Shooting of Kangaroos.

TERMS OF REFERENCE

It is proposed that the terms of reference for the working group to review the code will be to:

1. Conduct meetings to discuss and review the Code;
2. Call for public comments prior to drafting a revised Code;
3. Draft a third edition of the Code, should it be required;
4. Undertake public consultation on the draft Code; and
5. Present the revised Code to Council for endorsement.

MEMBERSHIP

It is proposed that the working group to review the Code should include:

- Representatives of State and Commonwealth agencies with responsibility for kangaroo management;
- Representatives of the Kangaroo Industry Association of Australia (KIAA), the kangaroo processing sector, RSPCA Australia and Animals Australia;
- A ballistics expert, qualified and experienced in the use of firearms; and
- An independent veterinarian qualified and experienced in Macropod physiology.

Appendix B

Membership of the NRMCC Working Group to review the Code of Practice for the Humane Shooting of Kangaroos.

Affiliation	Role
Western Australian Department of Conservation and Land Management	Statutory authority responsible for management of kangaroo shooting in Western Australia, and Chair of Working Group
South Australian Department of Environment and Heritage	Statutory authority responsible for management of kangaroo shooting in South Australia
New South Wales National Parks and Wildlife Service	Statutory authority responsible for management of kangaroo shooting in New South Wales
Queensland Environmental Protection Agency	Statutory authority responsible for management of kangaroo shooting in Queensland
Department of the Environment and Heritage	Commonwealth statutory authority responsible for management of commercial export of kangaroo products from Australia and compliance of statutory authorities with approved management plans concerning the commercial harvest of kangaroos
RSPCA Australia	Non-government animal welfare interests
Animals Australia	Non-government animal welfare interests
Primary Industry Standing Committee, Animal Welfare Working Group	Responsible for the production of Australian Codes of Practice for the welfare of animals in production agriculture.
Kangaroo Industry Association of Australia	Represents commercial kangaroo industries in Australia
Queensland Macropod and Wild Game Harvesters Association	Represents commercial kangaroo shooter interests
Independent Firearms Expert	To provide expert advice on firearms and ballistics relevant to the shooting of kangaroos, and independent of commercial kangaroo shooting interests