CIRCULAR TO WARDENS

065269

KANGAROO MANAGEMENT - PASTORAL AREAS

(October, 1972)

1. BIOLOGY OF THE SPECIES AND AIMS OF THE MANAGEMENT PROGRAMME.

The majority of kangaroo management problems in the Pastoral areas of the State involve Red Kangaroos (Megaleia rufa) and Euros (Macropus robustus). In some areas, however, the Western Grey Kangaroo (Macropus fuliginosus) is also involved e.g., the Nullarbor Plain; but this latter species is not generally found on pastoral lands and is considered within the framework of the Grey Kangaroo Management Programme. In the remaining pastoral areas of the N-W and Pilbara the former two species are reasonably common, and each contributes to the grazing pressure on the rangelands (i.e., pastoral leasehold with native vegetation). Populations of each species differ however in their habitat requirements, and the relative contribution of each species to a particular management problem is dependent on the type of country involved and the abundance of the species present. Red Kangaroos are generally found in the more open country, river flats and the like, which usually comprise the most valuable grazing for the sheep, whereas Euros are more common in the rougher hill country which is also less valuable from the pastoral viewpoint due to the poorer nutritional quality of the vegetation. In normal circumstances these species are fairly well separated by their differing habitat requirements, with the major problem of joint use of the grazing resource involving conflict of the requirements of the Red Kangaroos and especially sheep. (It is a fact that the best pastoral lands are also the most favourable habitats for the Red Kangaroo and that these areas can and generally do support large numbers of both sheep and Red Kangaroos. Euro habitat is generally unsuitable for the Red Kangaroo, and conservation of the Red Kangaroo is dependent on the populations being maintained on the better quality pastoral lands). In some situations, however, the Euros can invade formerly high quality grazing areas (and Red Kangaroo habitat).

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This change in distribution and the actual and relative abundance of Euros in comparison to sheep and Red Kangaroos can result when overuse of the better quality grazing areas leads to replacement of the former vegetation with less nutritious pastures of spinifex and other plants more typical of the usual Euro habitat in the hill country.

The above situation illustrates: i) that the presence of Red Kangaroos on the best pastoral area is obligatory if the species is to be conserved. Euro habitat may be poor quality pastoral land, but it is also totally inadequate for supporting populations of the Red Kangaroo; and ii) that kangaroo management problems in areas where there are large populations of Euros concern this species and not Reds.

In essence, the Kangaroo Management programme for the pastoral areas seeks to maintain viable populations of these species over as wide an area as possible on the principle of multiple land use, but to manage these populations in a way such that the best value may be obtained from the resource. To this end management is aimed at controlling the populations at levels below the maxima which could possibly be attained by these species under present circumstances, but above the minima necessary to ensure survival of the species. The reasons for adopting this strategy are varied, but the following points are relevant:-

i) the Department has primary responsibility to ensure the persistence of the different species of wildlife as far as is humanly possible. The maintenance of large, widespread populations of a particular species provides a considerable buffer against deleterious effects of fluctuations in the environment in local situations, and also requires less short-term precision and effort in management, with consequent economies.

ii) it appears that the most efficient means of population management for these species can be achieved by regulated

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commercial hunting, but dependence on this method of management requires some degree of security for the personnel involved so as to justify the expenditure on equipment necessary to realize the full value of the animals taken and to maintain an adequate spread of the management effort on a self-supporting basis. This can only be achieved with a relatively large and widespread population being maintained.

iii) It is generally accepted in ecology that the more diversity present in an ecosystem the greater is its inherent stability, and that there is more efficient transfer of resources within the system.

In simple terms, the degree of overlap in diets of the species of kangaroos and the domestic livestock is not nearly as great as is imagined, although there is considerable resistance to acceptance of this idea within the pastoral community. Certainly individuals of each type of animal may be observed at times feeding in the same area and even on the same species of plant, but the total diet consumed by a kangaroo cannot be considered transferable to a sheep for instance. The rangeland can therefore support a higher amount of use by some combination of the species of livestock and fauna than by either alone and maintenance of kangaroos on pastoral lands is ecologically sound, as well as being vitally necessary of their conservation. The direct cash profit to the pastoral licensee alone might not adequately reflect the social value and ecological worth of such joint use however, but it ought to be recognized that a pastoral lease confers rights of use of the natural pasture only.

iv) Matching of the above objectives would ensure that populations of these species would remain in areas easily accessible to tourists and others who may value the presence of these animals rather than the products which may be derived from them, or in their absence.

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2. THE MANAGEMENT PROGRAMME.

In practise the management effort is at present concentrated on the commercial exploitation of the Red Kangaroo, and the quota and license restrictions on the professional shooting sector are an attempt to achieve a degree of stability in population management for this species. It is thought that in the main the genuine professional shooters will concentrate their efforts in the areas of greatest abundance of kangaroos and thus achieve the most efficient spread of control without direction. In a general sense this appears to be true within the traditional hunting areas, but lack of mobility of some shooters based in areas which have been over-exploited appears to be a growing problem to be resolved in the future.

The proportion of the hunting effort presently expended on Red Kangaroos by the professional shooters in the traditional hunting areas is probably largely justified inasmuch that the highest Euro populations are found in the Pilbara and thus outside the most developed and accessible pastoral country. The issue of one class of carcase tag for both species in these circumstances does not therefore present a serious problem, but with expansion of shooting effort due to movement of shooters into the Pilbara, and the increased pressure from pastoralists wishing to avail themselves of the Damage License system, this problem assumes a greater degree of importance in directing management effort.

The proper role of the Damage License system within the framework of the management programme is to direct additional hunting effort to areas where real management problems do exist, but where the required level of effort would not otherwise be expended. The major area of need in this respect can therefore be seen to lie outside the areas normally used by professional shooters and in areas where Euro populations are concentrated. The responsibility for making this assessment of management need, and in applying conditions restricting use of tags to the species concerned with the problem falls largely on the Warden making a property inspection. This aspect is most important and is further discussed below.

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3. THE DAMAGE LICENSE SYSTEM.

As indicated above this system is intended to be supplementary to the regulated professional shooting, and ought to serve the purpose of directing effort to areas of real management need where effort would not otherwise be expended. This is quite distinct from allowing additional hunting pressure on a population because those animals present are accessible and could be taken if tags were issued. The point has already been made that areas supporting high kangaroo populations at all times are not necessarily the areas of greatest conflict in management needs. It is also true that density of kangaroo populations from time to time may vary on a particular type of country and that density of populations varies between different types of country at any time. This is a feature common to all animal populations and not just peculiar to kangaroos. In fact, the major changes in distribution and local density of kangaroo populations (or visibility and accessibility) are all short-term fluctuations in response to seasonal and other changes in their environment. These changes which occur within a few months generally represent relocation of the same total number of kangaroos forming a regional population, and do not represent an increase in the numbers within that population. This latter increase can only occur by recruitment of new individuals to the population in excess of deaths, and it requires a time lag of 2-3 years or more for new adults to be recruited into the population.

The above points should be particularly borne in mind when making Damage License assessment because the population being managed will not be confined within the particular pastoral lease boundaries. The phenomenon in question is usually only short-lived, and will often disappear in a few months. The fact that populations in these circumstances may also be extremely vulnerable to additional hunting pressure ought to be considered too.

In effect the Damage License system implies that the location where surplus animals are taken is of major importance. This does have political significance with respect to the landholder,

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but in terms of population management it is totally unrealistic.

Having regard to the above, it is important to realize that the primary objective of a property inspection is to gather biologically relevant data on the status of the kangaroo populations on the property. The first thing to do in these cases is to ensure that a representative coverage of the property is obtained during the inspection. With experience in a district this type of judgement will probably be easy to make, but it will require considerable time to acquire this experience. Generalized vegetation maps of individual pastoral leases are held by Pastoral inspectors, and are also probably obtainable through branches of the Department of Agriculture. Some stations possibly have maps of this type too. Armed with this type of information it is easy to plan an adequate inspection, and every endeavour should be made to ensure that a thoroughly representative picture is obtained. If it is not possible to cover all types of country then at least try to put the inspection results into a proper perspective. The question being asked is not whether there are any 'roos on the property, or whether a large proportion of these are concentrated on one or two small areas (which they will invariably tend to be), but, given the above factors, what is the general status of the kangaroo population in the area of the station? Often the main problem area overlaps a station boundary and this ought to be recognised too. It is not reasonable to treat the two properties as individual and unrelated problem areas. Even if only one property wishes to be issued with a License any decision ought to be made on the basis that the other property could subsequently make such a request affecting the same local area.

The next task is to carry out the inspection and obtain the data. This is generally obtained by doing ground traverses in selected areas as planned, as well as in those areas the pastoralist will want to show you. The results are generally set out in terms of numbers sighted over a certain number of miles included in each traverse. Every attempt should be made to identify the species of animals observed, but it is only relevant that the adult animals be included in counts. The value of this data can

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also be enhanced in two ways. Firstly, by recording the number of animals sighted in short sections of each traverse e.g., in say 20 miles of traverse if the numbers for each mile are recorded (including zero sighting records) then some idea of the variation in distribution and density can be derived. Secondly, by confining the sighting records to those animals within a strip which can be efficiently scanned while travelling through the varied situations encountered during a traverse. It is obvious that animals can be sighted in certain situations at long distances due to decreased density of cover. The method of counting over a defined strip on either side of the vehicle path can enable some estimate to be made of the actual density of the populations being surveyed. The actual width of the strip covered can be worked out from the average distance at which the majority of animals may be sighted and identified. This distance can be checked directly for verification as required. Generally one man alone in a vehicle might only be able to effectively cover a strip 1-200 yards in width. The speed at which the vehicle is moving also influences the efficiency of counting as do prevailing weather conditions. Factors which may be controlled should be standardized as much as possible. A similar principle ought to be applied when doing inspections in any other way too; e.g., in an aircraft a constant ground clearance and speed should also be maintained.

It is not necessary for data to be collected in the above way to obtain useful information if the survey technique is standardized, and Wardens may not be able to derive the full value from the detailed data collected as described; but any Warden wishing to collect data in the above manner will receive the assistance of the Kangaroo Management (Research) section in interpreting data provided with inspection reports.

Nevertheless data derived from the Kangaroo industry through the system of Form 3 returns is also available to Wardens directly at the field level during their normal course of duties, and can be used in conjunction with their own inspection data by Wardens to interpret the general status of the kangaroo populations in the areas under their control.

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The Form 3 returns provide a complete analysis of the animals being taken by the professional shooters, and also allow the calculation of some biologically relevant indicators. These are:-

i) Sex ratio i.e. proportion of males/females;

ii) Average carcase weights - the males are the important ones;

iii) The hunting success rate i.e. carcases/hour; by sex and collectively.

Copies of these Form 3's are retained in the return books so it is possible to check this data and obtain a comprehensive picture of hunting success at the one time.

Interpretation of the figures derived can be made as follows:-

i) Generally hunters seek to maximize their return for effort. As adult male kangaroos are generally larger than females this means that there is an incentive to select males in preference to females, especially as the allowed number of carcases is now restricted. Thus a higher proportion of male animals may be expected to be taken by shooters. It is most likely that males form something less than half the adult population normally so that 50% or more of males in the carcases taken can be taken as indicative of selection and the greater the excess of males in the take the greater degree of selection. Sixty percent (60%) or more of males in the take is generally indicative of an extremely abundant population, provided large numbers are being taken by the shooter(s).

ii) The hunting pressure exerted however will affect the life expectancy of the animals being taken, and the greater the pressure the shorter will be the average life of animals in the population being hunted. In the case of male kangaroos a regular increase in body size occurs throughout most of their life. Thus the body size of male roos is an indicator of age. While aged males can produce carcases well over 100 lbs in weight, the majority of males are generally much smaller, and the maximum average carcase weights of 50-60 lbs

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for males are generally found in areas where hunting pressu is not excessive, as this is about the average size of an average-aged male kangaroo. Carcase weight averages below 50 lbs. are indicative of increased hunting pressure, and weights of around 40 lbs. or less for males are generally representative of animals of only 3-4 years of age being taken. This is indicative of heavy exploitation and also, on some occasions at least, indiscriminate shooting. Comparison between shooters will enable this problem to be clarified for a local area. Doe carcases much less than 30 lbs. average are also usually indicative of heavy huntin pressure.

iii) The actual number of carcases obtained/unit of hunting effort is another indicator of abundance, although accessibility of Red Kangaroo populations tends to remain high under some conditions e.g. drought, even though population may be heavily exploited and much reduced in numbers. This is because areas which are drought refuges for this species are generally situated on the more accessible areas of pastoral lands, and the remaining animals are obliged to concentrate on these refuges. They then become extremely vulnerable to excessive over exploitation

Even so there is value in this index when taken in conjunction with other data. There is a general upper limit of about 100 carcases which one shooter working alone can handle in one nights hunting, and this works out at around 8-10 carcases per hour overall, with a maximum sex ratio of about 60% males. It appears that higher sex ratios of males reduce the number of carcases which can be taken although the actual carcase weight obtained per night does not differ much. A maximum average of 6-8 carcases per hour appears to be the limit when a very high proportion of males is taken e.g. 75-90% or more. Hunting success rates lower than these established maxima can partly reflec shooter efficiency but this can also be resolved. Overall rates of 2-4 carcases per hour are exceedingly poor and would definitely represent a scarcity of kangaroos in an ar

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iv) High proportions of Euros being taken in relation to Reds also generally represent a scarcity of the commercially more valuable species in the present circumstances. Maximum average proportions of Euros taken are generally in the range 5-10% of the total numbers taken by professional shooters, and these generally include few if any females.

Data derived from Damage License inspections so far this year (1972) show that general average numbers of kangaroos sighted range from as low as ½ to 2 kangaroos/mile in some areas to upward of 5-10/mile in others where the reports provide representative inspection data. The proportions of Euros recorded also vary. In some cases Euros appear to be almost as numerous as Reds. Invariably in these cases the low average sightings have been reported from areas where interpretation of Form 3 data as outlined above indicates that the populations are depleted and that the issue of Damage Licenses ought to be carefully considered. In some instances the body of data provided does not support any case for issue of a license. Nevertheless it is still possible to find dense local aggregations of roos at certain times and places within this same area. Such aggregations are a natural consequence of the biology of the Red Kangaroo, and will continue to be found while a population remains in an area. They will also provide a constant source of conflict between the biological requirements of the conservation programme and the individual pastoralists who happen to receive the attentions of the main body of a local population in these circumstances. There can be no easy solution to this conflict, and a decision based on the density and accessibility of such a local aggregation as no doubt desired by the pastoralist will not be possible if the aims of the management programme are to be achieved. All Wardens should fully understand that this is a biologically obligated, direct and ever present source of conflict which cannot be compromised if viable field populations of Red Kangaroos are to be retained in the pastoral areas. It should also be remembered that these areas contain the bulk of the Red Kangaroo population in the state, and that conservation of this species in fact means conservation within the pastoral areas. To a lesser extent this also applies to the Euro.

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4. DECISION MAKING.

Having completed the inspection and having previously become acquainted with the general status of populations in the area concerned, a decision is required. The grounds for making this decision should be primarily based on the biological data available and interpreted within the framework of the management programme as outlined. If the biological data does not indicate that a license is warranted then it should not be issued. Here the Warden should indicate that he can see no grounds for issuing a license on the data available, but he should also advise the pastoralist that a full report of the situation will be forwarded to the Head Office of the Department. In this way a Warden can adhere to his direct responsibilities and make straight forward decisions on the facts he has gathered without taking responsibility for political or policy matters. In these circumstances a Warden can be satisfied that he has acted conscientiously and correctly on the facts he has obtained, and if a decision to refuse a license is later reversed, the reversal can quite clearly be seen to be based on political grounds. There can be no reflection on the ability and competence of the individual Warden in this instance. On the other hand, a Warden who issues licenses where the data in the report he has prepared does not support the decision made is not doing himself justice, and his ability may also be placed in doubt. In addition to the above a Warden moving into a new area should also endeavour to obtain the fullest briefing on the current situation there before making these management decisions, otherwise he may easily make inappropriate decisions based on an incomplete assessment of the real situation. This ought not to occur.

In the main, arriving at the correct decision in this situation is a matter of commonsense. A Warden who is fully informed on conditions in his area and fully appreciates the circumstances in which these licenses ought to be issued and the grounds for issuing the licenses will always be able to make the correct decision required from him. If there is any doubt about a decision then an additional opinion ought to be sought. This is preferable to making a possibly ill judged decision on the spot.

Wardens uncertain on any aspects of the management scheme should also attempt to have these matters clarified by making the appropriate enquiries. Assistance will be forthcoming.

SUMMARY.

The Red Kangaroo (and Euro) Management Programme is complicated by the presence of conflicting legislation i.e. "Fauna Conservation Act" and the "Vermin Act", especially in relation to the pastoral "Damage License" situation. The presence of this conflicting legislation is generally known. Despite the incompatibility of the "Vermin Act" in this case with the "Fauna Conservation Act", this aspect of conflict has influenced the overall policy of Kangaroo Management as administered by the Department of Fisheries and Fauna with its wider responsibility in this field, and should not further influence your decision.

When undertaking work associated with "Damage Licenses" it is reasonable to concede that there certainly is general cause for control of kangaroo populations in the pastoral areas. However, it will become apparent that there is a great deal of variation in opinion among individual pastoralists as to the degree of control which ought to be exercised. This will always be found, and has to be accepted as part of the job. On the other hand it is also impossible for a Warden or pastoralist to prove that a particular amount of damage due to a given number of kangaroos is occurring on the property concerned. The only facts that can be determined are whether kangaroos appear to be abundant or not, and whether this abundance is general, or restricted to particular sections of the property and the surrounding area. Quantitative data can be obtained on this aspect by way of an inspection. Once this data is obtained its interpretation depends on comparative guidelines as set out, and the action to be taken is determined by the management policy of the Department.

The management policy itself already incorporates decisions made on the basis of the various aspects of conflict which may arise. The Warden's role therefore is to administer this policy at the field level as required.

Granted, the job itself places a Warden in some almost intolerable situations at times, and field inspection is really of limited value in making population assessments. Nevertheless the commitment to do this work remains with us, and decisions are required at the field level.

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For a Warden to effectively carry out his duties in this field he should;

a) understand the management policy of the Department in general, and the particular role which he is required to fill;

b) make an objective appraisal of the actual problem at hand. This appraisal should be based on (i) knowledge of the representative nature of the inspection carried out, (ii) the quantitative data obtained from the inspection, (iii) other indirect information concerning the status of the local kangaroo population.

c) having interpreted the body of information available (as set out above) in accordance with guidelines provided, make a decision as required by the management policy.

To do an adequate "Damage License" assessment in this situation it is required that;

a) Prior knowledge of the different classes of country on the station be obtained so that a plan of inspection can be made. Station maps containing this information are usually held by Pastoral Inspectors of the Lands Department, and also Regional Vermin Control Officers. These avenues of information should be used. R.V.C.O.'s especially can provide additional local information on the presence and abundance of feral animals, and other information concerning the station may also be obtained in this way e.g. stock numbers etc.

b) Review the hunting data available from the professional kangaroo trade by way of Form 3's so that you have up to date knowledge on availability of kangaroo populations in the area.

c) Decide upon a general inspection plan which will need to be carried out to gain an adequate appraisal of the situation involved.

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d) Having arrived at the station discuss the extent of the problem believed to be involved with the owner or manager, and also confirm property details.

e) Accompany the person involved on whatever inspections he may wish you to make. Before setting out however check the route it is planned to follow with the inspection plan you have prepared beforehand. It may prove necessary to include other areas of the property as well as that proposed for you to obtain a fully representative picture. This is your responsibility, and the method adopted to do this job properly is your prerogative. A decision based on a limited appraisal of a situation may not be appropriate however, and will ultimately reflect on your ability. The requirement here is that adequate comparative inspection data is obtained for the station concerned. With experience and local knowledge of a situation direct inspection of only a fraction of the property may be adequate indication for a reasonable decision, but in other cases where you are not familiar with the area and country involved a more detailed inspection ought to be made initially.

It is not intended however that any Warden should undertake hundreds of miles of traverse on a station poking into the furthermost corners of poorly accessible country which might reasonably be expected to be almost devoid of kangaroos, but the figures reported on the Pastoral Properties Inspection form should be adequate to satisfy independent assessment of the decision made if required.

f) Counting data reported should include animals sighted and mileage covered between the particular local aggregations which usually will be found. These local aggregations will generally be the situations to be shown to you by the pastoralist, and the information obtained here will therefore be biased towards the highest population density found on the station. A Warden is required to gain an appreciation of the general abundanceof kangaroos during these inspections, and to consider this factor when making his decisions.

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Inspection Data collected in this manner and recorded on the inspection report sheets is also invaluable during review of the management programme from time to time and can aid the Department in evolving better policy decisions as necessary. Your efforts are therefore of greater significance than the short term administration of a particular policy, and this inspection data is an integral part of the body of knowledge being accumulated by the Department as a check on the progre of the management programme.

g) The inspection technique employed should be comparable for each Warden, so that the general picture reported could be obtained independently by a second person e.g. relieving Warden during periods of leave for the usual District Warden, or a new Warden moving into a District Office.

It is recommended that a reasonably steady speed be maintained during an inspection traverse, such that there is a reasonable chance of sighting animals which are present. The sighting records ought to be confined to a strip on either side of the track which can be efficiently covered too. It might be possible to see particular animals half a mile or more away over a flat, but efficiency in spotting animals closer to the track is reduced in this situation, and it is not easy to get any accurate idea of distance from the track at long range; on the other hand data collecte over a smaller defined strip on either side of the track will be more comparable between the different types of countr surveyed, and can also enable you to get a rough idea of the actual density if desired.

It is probably not practicable for a single person to both drive the vehicle and efficiently survey a strip on either side of the track much more than 1 - 200 yards in total width, especially if the vehicle speed is high.

h) Traverse figures should be converted to average numbers per mile by species for interpretation. Average numbers being reported to date for Red Kangaroos range from ¼ - 2 'roos per mile to upwards of 5 - 10 per mile.

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Where the lower density values are recorded i.e. less than 2 'roos per mile, the issue of a "Damage License" is not generally consistant with the overall aims of the management programme and refusal of a license is indicated especially at the extreme low density. At densities around 2 per mile and slightly higher caution should be exercised in granting licenses, and conditions carefully considered. Upwards from these values proportionate relaxation is in order.

i) A decision based on a single factor is obviously subject to error more often than one based on fuller consideration. The Form 3 data available to the Warden provides useful supporting data to an inspection.

The figures you can get here are; % males being taken; the average carcase size of each sex, especially the males; and the numbers being taken per hour of hunting.

Low average abundance of 'roos may be indicated by any or all of the following; a generally low (i) proportion of males, (less than 50%) for most shooters in a district; (ii) male carcase weight, especially in the range below 45 lbs.; (iii) hunting success rate progressively less than 4 'roos per hour (males and females combined).

No licenses should be issued where the following factors are found.

i) less than 2 'roos per mile on representative inspection.
ii) average % males being taken much below 50%.
iii) average male carcase weight in the low 40's or perhaps even less than 40 lbs.
iv) average hunting success less than 3 - 4 'roos per hour (both males and females).

In contrast kangaroos can be considered to be extremely abundant where:-

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i) average sightings are up around 8 - 10 per mile.
ii) average % males being taken is 60% or more.
iii) average male carcase weights generally exceed 50 lbs.
iv) average hunting success exceeds 6 - 7 'roos per hour (males and females included).

provided the hunting statistics relate to the activities of a truly professional shooter.

In between those limits decisions ought to be adjusted accordingly.

j) Whatever decisions are finally arrived at they ought to be seen to be consistent within a local area i.e. limits, conditions, expiry dates ought to be adjusted according to the size of the stations in similar situations regarding average abundance of kangaroos.

k) The decision you make for a particular case ought to be similar to that which might be expected from one of your colleagues if he had handled the job in question.