AUSTRALIAN HONEY BEE INDUSTRY COUNCIL

Address: Suite 4, Level 6, 99 Elizabeth Street, Sydney NSW 2000 Telephone: 02 9221 0911
Mailing Address: PO Box R838, Royal Exchange NSW 1225 Facsimile: 02 9221 0922
Email Address: ahbic@honeybee.org.au Web Site: www.honeybee.org.au
ABN: 63 939 614 424

HONEY BEES IN AUSTRALIAN CONSERVED FORESTS

POLICY DOCUMENT

July 2005.

CONTENTS

POLICY STATEMENT

- The Australian beekeeping industry economy critically depends on the conservation of, and access to, native forests and woodlands throughout Australia. This factor and the industry's long intimate working relationship and understanding of the natural environment and its dynamics, has given its participants a deeply ingrained philosophical ethic to conserve the resource. AHBIC therefore sees Government decisions and management strategies which are designed to achieve nature conservation goals as highly desirable, and seeks through consultation to be a party to such initiatives.

- It is the view of AHBIC that, in Australian conserved forests, the impact of migratory, managed honeybees on the reproductive success of flora and fauna, external to any perception of impact by permanently resident feral honeybees, is unlikely to be significant.

- The evidence does not exist that would convincingly support the development of management policies for conserved forests which sought to exclude the presence of migratory, managed honeybees, on a basis of adverse impact on the reproductive success of native flora and fauna.

- AHBIC is therefore resolute in its endeavour to persuade Australian Governments and their relevant Departments that traditional industry access to conserved public land in Australia should be maintained, and in the case where future conserved forests become designated, that traditional access to such areas should be maintained.

- Where maintenance of industry viability or expansion may be possible through the working of Australian forests and lands which have been previously unused for beekeeping, access by beekeepers to such areas should not be arbitrarily precluded.

- AHBIC accepts the day to day operations of apiarists in conserved forests should be consistent with reasonable management guidelines that could be developed through formal consultation between industry and conserved forest managers.

SUMMARY

The Australian Honey Bee Industry Council (AHBIC) is the national peak body representing the apiary industry in Australia and is responsible for the formulation, dissemination and promotion of industry policy in Australia.

The intention of this policy document is to recommend to State and Federal Governments that management strategies for existing and future conserved forests and lands, including Nature Reserves and National Parks, should continue to provide for usage by commercially managed honeybees *(Apis mellifera)* particularly wherever a history of usage by industry can be demonstrated.

Australian honey producers are greatly dependent on the native plant resources of the nation for their livelihood. For many decades, the industry has worked very hard, alongside other community sectors, to retain as much of Australia's native plant resources as possible, sometimes in the face of considerable odds.

For some time, community awareness of the need to conserve our natural heritage is now being reflected in increasing amounts of public land being set aside for nature conservation by State and Commonwealth Governments.
Honeybees, first successfully introduced to the Australian environment in 1822, became permanently established as part of the ecosystems of most Australian forests by 1860. The population remains self sustaining. The emergence of the Australian beekeeping industry during the latter half of the nineteenth century derived its initial honey bee stocks from the wild population. Some ecologists are concerned that honeybees may be adversely affecting the reproductive success of native flora and fauna. The evidence supporting such perceived effects, when subjected to critical analysis, particularly so far as managed honeybees is concerned, remains unconvincing. Some people also see the practice of commercial beekeeping in conserved forests as exploitation of a public asset that should not be allowed.

Unfortunately, on the basis of such tenuous information, managers of conserved forests in some States seek to restrict traditional access by the industry, or have foreshadowed their intention to do so.

As the area of conserved forest continues to expand in Australia, in so doing embracing forests to which commercial beekeepers have had traditional access, so will the problems of industry in maintaining commercial viability increase, if relevant land management policies exclude beekeeping.

Since 1990, the peak industry body and the Honey Bee Research and Development Committee (HBRDC) have been proactively engaged in encouraging independent research into the interaction between ***migratory***, managed honeybees and the natural environment. The emergence of data from such research is referred to in the body of this document.

THIS POLICY DOCUMENT FOCUSES IN SOME DETAIL ON EXPERT OPINION THAT THE WORKING OF ALL NATIVE FOREST SYSTEMS IN AUSTRALIA BY THE MIGRATORY APICULTURE INDUSTRY, WHOSE OPERATIONS ARE BASED ON SHORT TERM OCCUPANCY OF RESPECTIVE BEE SITES, IS SPORADIC IN NATURE AND OCCURS WHEN THE POTENTIAL FOR FLORAL ABUNDANCE IS AT ITS PEAK, DOES NOT ADVERSELY IMPACT ON THE REPRRODUCTIVE SUCCESS OF NATIVE FLOR AND FAUNA. ACCORDINGLY, AHBIC SUBMITS THAT MANAGED, MIGRATORY APICULTURE IN CONSERVED FORESTS IS NOT INCOMPATIBLE WITH THE OBJECTS OF NATURE CONSERVATION.

For industry to maintain its commercial viability, it must continue to have access to Australian forests and other melliferous lands. The value of commercially managed honeybees to the community far outweighs the direct farm gate returns to industry, because of benefits received by the community through incidental and planned pollination (fertilisation) services to the food and seed crops of this nation. The native forests of Australia play a critical role in the maintenance of a strong and healthy managed honeybee population which is the basis for the wider community's crop pollination resource.

The policy document also includes a draft code of practice which could be developed to provide satisfactory guidelines for the management of honeybees in conserved forests.

POLICY DOCUMENT

1. INTRODUCTION

This document has been prepared by the Australian Honey Bee Industry Council (AHBIC) in response to criticism by some ecologists about the management of honeybees in Australian conserved forests, and provides factual information to Government and other people who are interested in the formulation of relevant management policies.

2. THE APICULTURE INDUSTRY

There are approximately 650,000 registered beehives in Australia, operated by 9500 registered beekeepers, including 2,000 commercial or semi-commercial and hobbyist beekeepers, collectively producing about $60 million worth of honey and beeswax per annum, at the farm gate. About 40% of this production is exported. However, the greatest economic benefit of the industry to the community stems from the pollination (fertilisation) of agricultural and horticultural crops by honey bees, the value of which has been calculated to be up to $1.7 billion per annum *(R Gill, 1989, University of New England reviewed and updated 2003, HBRDC.]* In addition to honey production other industry sectors include – crop pollination services, queen bee production for domestic and export markets, and honey packaging. Retail value of honey sold in Australia in 2004 was $200 million.

Most commercial apiarists operate between 400 and 800 hives. Some operations are much larger, managing up to 3,000 hives. Apiarists migrate hives several times a year to areas where it is known that periodically, a plant species, or several species of plants, will flower and usually provide a continuous source of nectar and pollen during a predictable calendar period. About half of an apiarist's sites are likely to be located on public land, and about half on private land.

Eucalypt species and varieties collectively represent the bulk of available nectar and pollen resources for Australian honeybees. Eucalypts, therefore, form the main economic resource base for Australian commercial apiarists, who depend greatly on access to forest and woodland areas for their livelihoods. This resource is reducing for apiarists. Land clearing, urbanisation, forestry practices, public land management practices, forest diseases and pests and fire are all reducing the area of land available to apiarists.

It is important for key people who have an interest in this matter to understand the foraging area requirements of a commercially managed apiary sited at an efficient stocking rate.

For example, in Victoria, commercial apiarists regard an economically efficient foraging area for an apiary located in most eucalypt forests to be about 800ha. In Victoria, an average commercial apiarist occupies on an occasional basis about 20 individual bee sites and about 16,000ha of foraging area **per annum.** This example is very much a rule of thumb measure, for there would be up and down estimate variations not only within Victoria, but in all other states, according to the extent and type of available forage. For example, in Queensland forests, 200ha is generally regarded as being an economically efficient foraging area for a commercial apiary.

It should be understood that in the long term many more than 20 bee sites are used by commercial apiarists in order to provide necessary usage flexibility, because most bee sites do not provide commercially useful honeybee forage on an annual basis.

In all states, some types of forest represented in present and possibly future conserved forests that have a history of migratory managed beekeeping activity, do not occur elsewhere in sufficient quantity to allow satisfactory relocation of apiaries which would be displaced if management decisions to exclude commercially managed honeybees from present or future conserved forests occur.

Such displacement would represent a permanent loss of industry floral resources and attendant viability limitations. It should also be understood that access of migratory managed honeybees to the nation's forests from time to time represents a 'safe harbour' (and sometimes a rehabilitation area) for managed honeybees against the effects of pesticides, herbicides and natural hazards in Australian farm lands. Viability of the community's important crop pollination resource, principally vested in commercially managed honeybees, is therefore also enhanced through the continued access of managed honeybees to Australian conserved and other forests.

3. LAND CONSERVATION

An objective of the conservation movement being reflected in Australian conserved public land management policies, is to preserve examples of as many different natural ecosystems as is possible, and to keep those areas in as pristine a state as is possible. The objectives of the beekeeping industry and the conservation movement are, therefore, complementary in many ways. An examination of the historical record over six decades shows the prominent role the beekeeping industry has played at land management and other levels in developing a community awareness of the need to conserve this nation's natural heritage.

Unfortunately, a number of ecologists and conservationists have taken the position that, because managed honeybees are also exotic animals, they have no place in any conserved area at any time or under any circumstances. In addition, some conservationists are strongly opposed to what has been termed by some as the commercial exploitation of conserved forests. It appears to AHBIC that these are ideological positions, and they also reflect a lack of understanding of Australian commercial honey industry apiary migration practices, which are geared principally to

sporadic (often years apart) eucalypt species flowerings. Such positions also do not take into account the large and permanent feral honeybee populations that have been a part of Australia's ecosystems for at least 140 years.

Unsubstantiated claims and doubtful data have been used to justify some of the more extreme positions. It is the hope of AHBIC that this policy document will allow reasoned discussion, and the eventual development of management strategies that will serve the dual objectives of nature conservation, and the provision of adequate floral resources for the beekeeping industry.

4. CLAIMED ADVERSE ENVIRONMENTAL EFFECTS OF HONEYBEES

Matthews (1984) and Pyke and Balzer (1982) outlined the major concerns of conservationists with respect to the claimed adverse effects of honeybees on Australian native flora and fauna. Briefly, these concerns are as follows:

4.1 Reduction in the available nectar for native nectar feeders

As honeybees are efficient foragers, they reduce the standing crops of nectar available to native fauna, with a consequential adverse effect on those fauna.

4.2 Inefficient pollination of native flora

It is claimed that, for some species of native plants, honeybees remove the nectar from flowers without pollinating the plant. It is also claimed that honeybees sometimes physically destroy native flowers in their foraging activities.

4.3 Hybridisation of native plant species

The honeybees may cause an increase in inter-specific hybridisation of native plants, which may be considered detrimental.

4.4 Long term decline of native pollinators

The efficiency of the honeybee in collecting nectar may reduce the ability of native pollinators to survive. Apart from the reduction in food supply for these species, it has been claimed that honeybees are "aggressive" and will physically push native insects off plants.

4.5 Competition for nesting sites

Honeybees reproduce by swarming in spring. These swarms may occupy nesting sites of native birds and animals in hollow trees and the like, to the detriment of these species.

4.6 Plant pathogen spread

It has been claimed that honeybees and beekeepers' vehicles may be implicated in the spread of plant pathogens.

4.7 AHBIC recognises the above claims to be genuine **concerns.** However, they are claims only. The historical body of research, when subjected to critical analysis, does not support the claims, particularly as far as migratory beekeeping practices are concerned. Most of the claims that have been made are erroneous, as will be shown below. Other research, properly focused on migratory practices, is shedding more confident light on the issue.

5. THE EVIDENCE

5.1 Reduction in the available nectar for native nectar feeders

Honeybees are efficient foragers and it is logical to expect their activities reduce the standing crops of nectar available to native nectar feeders.

The question is: how much reduction in nectar is possible before there is a significant adverse effect on native fauna?

Unfortunately, there is little published work which is directly relevant to this question. Paton (1979, pers.com.) reported that honeybees reduced the standing crop of nectar by about 50% at one particular study site, and that this caused on increase in the territories required by a honeyeater species. Schaffer et al (1979 demonstrated that honeybees preferentially exploit rich sources of nectar and displace other species.

Both these studies have serious limitations so far as application to testing the interaction between migratory, managed honeybees and the reproductive success of native flora and fauna. This is because:

- they were conducted in areas where the nectar resources were limiting;
- whether the studies focused on feral or managed honeybees, or both, is not discussed;
- commercially managed honeybees are usually moved to sites when there are prospects for a super abundance of nectar.

Such periods of abundance occur sporadically in eucalypt forest systems. Most eucalypt species, for example, may flower and yield nectar/pollen at intervals of several years apart. The flowering period according to species is usually then only a matter of weeks, but can occasionally be longer. For example, the eucalypt river red gum (E. camaldulensis) flowering period is about six weeks in duration. On average, three general flowering periods occur every ten years. Therefore bee sites in red gum

forests on average have a potential to be stocked for 18 weeks out of every 520 weeks.

These natural dynamics serve to illustrate why commercial beekeepers need to retain occasional access to many different forest systems in order to maintain production continuity and viability.

Another earlier approach to determining competition effects was to make counts of various bee species in a transect away from an apiary. Reduction in the number of native bees close to the apiary would indicate competition. Such a study was reported by Pyke and Balzer (1982). Again, if such a study is not conducted under conditions of high nectar availability, then the results will be of dubious value in assessing the effects of migratory managed honeybees on the environment.

5.2 Other Research

5.2.1 Pyke et al 1993 showed that the density of resident honey eaters in heathland was very similar from one area and year to another, despite large variations in the supply of nectar energy. The most likely explanation for this is that population density is determined by the spacing behaviour of birds, rather than by nectar production/availability or other factors.

5.2.2 In an attempt to find definitive answers to the specific question of what impact migratory beekeeping practices have on the reproductive success of native flora and fauna, other important studies have been performed since 1991. These studies were the first of their kind performed anywhere in Australia, or the world for that matter. Through early consultation between interested parties, adequately focused project design was agreed and implemented. The studies were:

5.2.3 Assessment of Competition between Honey Bees and Native Bees

(M.Schwarz et al, Latrobe University 1991-92), final report still pending. This experiment was conducted in the Cobboboonee State Forest, Victoria and was timed to coincide with a period when the forest was occupied by large numbers of managed honeybees that had been migrated to the forest to work a major messmate (*E obliqua*) nectar and pollen flow. According to progress reports, ***no adverse impact*** on the reproductive success of native bee species occurred. ***Some increase in reproductive success*** of native bees was observed, as might be expected under abundant nectar and pollen conditions from time to time. Predation of native bees by other fauna for food may also have been reduced by the large numbers of honeybees available for predation.

5.2.4 Impacts of Commercial Numbers of Honey Bees on the Flora and Fauna of Banksia Heathlands in Ngarkat Conservation Park *(D Paton, University of Adelaide 1990-91.*. This experiment was conducted in the Ngarkat Conservation Park, South Australia, when bee sites were occupied by managed honeybees migrated to the area for overwintering. banksia *ornata* provided the majority of the nectar and pollen resource. The project indicated that the managed honeybees were likely

simply harvesting surplus nectar and pollen that was not being utilised by native biota, and as a result, were having no effect on reproductive success. The conclusion was qualified to the extent that 1990 may have been an unusual year in so far as nectar/pollen availability is concerned, and more research in other years needs to test this conclusion. Measurements of previous rates of seed production of *B. ornata*, however, suggested that the patterns of 1990 may be typical. Higher rates of seed set near some apiaries indicated native fauna may not be providing a full pollination service to *B. ornata*. The report also showed that quantities of nectar available at inflorescences for native fauna after honeybees had foraged, even close to honeybee apiaries, was substantial. In 1991, drought conditions prevailed, and native fauna consumed most of the available nectar/pollen resources. Under such limiting conditions, managed honeybees were not introduced as hive populations would have declined under the adverse conditions.

5.3 Inefficient Pollination of Native Flora

Australia's plants evolved in the absence of honeybees and it has been claimed that honeybees might be inappropriate pollinators, leading to long term changes in plant populations. Such changes have been claimed (Wilson 1970; Hakeswood, 1981; Matthews, 1984). The kinds of changes that it is claimed might occur are as follows.

5.3.1 Honeybees might cause inter-specific hybridisation between native plants

This has been suggested by Douglas (1977) and Wilson (1970) with evidence. However, Bernhardt and Walker (1984) demonstrated that the foraging activities of honeybees on wattles could not cause inter-specific hybridisation, while Brown and Kodric-Brown (1979) demonstrated that the activity of hummingbirds did so.

Contrary to statements made by Matthews (1984), honeybees are unlikely to cause increased levels of inter-specific hybridisation, as they have a high species fidelity when foraging (von Frisch, 1953).

In 1974, Michener, as a general observation, noted that "probably all genera of bees (there are many thousands of species throughout the world) that gather pollen from a wide variety of flowers show a tendency for constancy to a given kind of flower on a particular foraging trip. Such flower constancy is incomplete, mixed loads of pollen show that it often breaks down".

AHBIC submits it could, therefore, be argued that if native plant hybridisation is perceived to occur in Australia because of honeybee activity, then such function must also extend as a natural role of the three thousand or more species of Australian native bees, native birds, and other agencies.

When analysing Michener's hypothesis, it must also be kept in mind that, whereas foraging behaviour studies are far from complete for Australian native bees, the foraging behaviour of honeybees has been comprehensively studied, and the high species fidelity of honeybees reported by von Frisch can be amply corroborated.

Wapshire, CSIRO 1987 (pers.com.) states that the hypothesis that honeybees increase hybridisation of native plants cannot be tested experimentally, although in theory, the hypothesis could be tested by comparing the proportion of hybrids in an insect pollinated native plant genus against the proportion of hybrids in a wind pollinated genus. Unfortunately however, inter-specific hybridisation rarely occurs, if at all, between native wind pollinated plants in Australia.

According to studies by Wilson (1979) and Barlow (1959, 1983), hybridisation rates are not higher in Australian insect pollinated native plants. This suggests that clearing and other human disturbance, by bringing previously separated plant species together, may be the reason for perceived hybridisation increase. The phenomenon has been documented in Egypt, where wind pollinated Casuarina species from Australia, grown together, have hybridised (El-Lakany 1983).

The only known research into the question of honeybee foraging fidelity that has been performed in Australia is the work of J Jackson, Waite Agricultural Research Institute, South Australia, 1990-91, with cultivars of almonds. His work demonstrated that even with very closely related cultivars within the species, honeybees have a remarkable ability to differentiate between the pollens of respective cultivars, and forage with remarkable fidelity.

AHBIC submits that hybridisation of native plants in Australia is a natural evolutionary function. The occurrence of eucalypt hybrids in all Australian mature age forests and wood lands that are hundreds of years old bear testimony that hybridisation was occurring in Australian forests long before the advent of honeybees in this country. AHBIC submits, on the evidence, interspecies hybridisation of native plants cannot be attributed to honeybees.

5.3.2 Honeybees are ineffective pollinators of native plants

Matthews (1984) claims that honeybees are **ineffective** pollinators of some native plants, in several respects. In fact, there are no published reports of honeybees ineffectively pollinating native plants. However, it is known that honeybees are not effective pollinators of certain plants exotic to Australia. Thus, it is possible that certain native plants could be inadequately pollinated by honeybees.

Caroline, McLeay Museum (pers. Com.) has demonstrated that honeybees force open flowers of ***Pultenaea,*** possibly decreasing seed set. However, this study was conducted in an area where honeybees have been endemic for over 100 years. ***Pultenaea*** is still common in the area, indicating that the plant has been little affected by the presence of honeybees. Thus the **only** study of "ineffective pollination" has shown that bees have little long-term effect.

It has been claimed that honeybees chew holes in the corolla tubes of some native flowers. This behaviour has not been observed (Sugden pers. Com.), although honeybees may utilise existing holes made by (native) insects.

In a research trial, D. Sommerville (NSW Agriculture, Pollination of Faba Beans, 1993) observed that there was no evidence of honeybees chewing holes in the base of

flower corollas, even though the trial site was saturated with honeybees, and available nectar was extremely limiting. D. Sommerville also reports that overseas, **bumble bees** have been observed chewing holes in corollas to which honeybees may later gain access.

Feral honeybees are present in nearly all Australian native forest systems and it is questionable whether any of the perceived effects of adverse pollination would be reduced by excluding migratory commercially managed bees from conserved forests. The main honey crops harvested from native forests are from Eucalypts and Banksia, and there is no possibility that honeybees adversely affect species of these genera. The inflorescence is too robust for damage, and the foraging activity of honeybees on these genera ensures effective pollination.

5.4 Long term decline of native pollinators

There is no conclusive evidence that native pollinators are adversely affected by the short term presence of commercially managed honeybees. It can be shown that when resources are limiting, honeybees can temporarily reduce the population size of some native species. This does not necessarily mean a permanent decline, or a reduction in reproductive success.

Native fauna species have evolved to cope with population perturbations due to natural dynamic forces such as drought, fire and flood. In any case, managed honeybees are migrated to avoid limiting nectar conditions because not to do so would result in a loss of apiary viability. In addition, most nectarivorous fauna reproduction is critically geared to native plants flowering annually, (usually spring/early summer) and not to the occasionally abundant eucalypt nectar flows.

The best way to determine if managed honeybees do adversely affect native pollinators in the long term is to assess the impact of large numbers of bees on the reproductive success of competing species. The research discussed in this document beginning under section 5.2 focuses on this key factor. AHBIC remains supportive of future research into this complex matter and will cooperate with the scientific community on any relevant project based on sound design principles.

Pyke and Balzer (1982) claim that honeybees are “aggressive” and physically push other species off plants. However, they do not define “aggressive”.

AHBIC submits that any scientist or other person familiar with honeybees management is aware the **foraging** honeybee is not aggressive in terms of being ready to attack other animal species. When foraging, the honeybee is completely non aggressive, being preoccupied with provisioning its parent hive with nectar, pollen, water , or other substances. Honeybees may only become aggressive when stimulated, in response to some danger to their home (hive), to defend their hive. This situation has no relation to honeybee foraging behaviour.

5.5 Competition for nesting sites

5.5.1 Honeybees reproduce mainly in the spring and it has been claimed they compete for nesting sites to the disadvantage of native animals and birds. This is not a major problem in undisturbed environments. Honeybees prefer a cavity that has a very small entrance, and a volume of about 35 litres (Seeley, 1977). Such cavities would not be suitable for most native fauna as nesting sites.

Undisturbed environments contain many thousands of available hollows for potential nesting sites per square kilometre, supply far exceeding demand in these circumstances.

Studies incidental to the question during the 1980's by the CSIRO Division of Wildlife and Rangelands Research near Bega on the New South Wales south coast have supported Seeley's hypothesis, with the further observation that the environmentally rich forests of that region contain a high percentage of tree cavities unoccupied by either native fauna or honeybees. In other words, competition for nesting sites is not limiting to native fauna in this region.

In addition, managed honeybees, wherever they may be located in the spring of each year, are usually controlled to minimise swarming to conserve hive populations for production (economic) reasons. Genetic improvement of stock through selection against the reproduction characteristic (swarming) has greatly improved this facet of spring management.

It should be understood that feral honeybees are self-perpetuating populations in all forest systems and do not need support from managed apiaries to remain so.

It should also be understood, because of sporadically abundant nectar production dynamics in eucalypt forest systems, feral honeybee populations are thus regulated by nature to proportions that ebb and flow according to long term food supply in each region.

5.5.2 Research

A survey of nesting sites of feral honeybees and regent parrots *(Polytelis anthopeplus)* was performed in the red gum/black box *(E. largiflorens)* woodlands of Wyperfield National Park, Victoria, by B. Oldroyd et al, Latrobe University, 1994.

Interestingly, managed honeybees had not utilised this region for more than 20 years. By world standards, a high density of feral hives were recorded at a rate of 77.1 hives per km². Approximately 11,000 hollows per km² were also recorded in this undisturbed woodland/forest system. Based on the above data, only 0.7% of hollows were occupied by feral honeybees, leaving 99.3% hollows available as nesting sites for other fauna. Fifteen pairs of nesting regent parrots were recorded.

5.6 Spread of plant pathogens

- **Vehicle movement**

Beekeepers are aware of the problem of vehicle movement and soil pathogen transfer, and could be expected to cooperate in management policies to prevent transfer. Management systems developed in Western Australia have proved quite workable so fas a beekeepers are concerned. (Department of Conservation and Land Management WA). Beekeepers are **dependent** on healthy forests for their livelihood and are acutely conscious of the need to be responsible in sensitive areas.

5.7 Incidental spread of fungal disease through honeybee foraging

There is no evidence that foraging honeybees enhance the spread of fungal diseases.

6. CLAIMED ADVERSE EFFECTS OF COMMERCIAL HONEYBEES ON THE GENERAL PUBLIC IN CONSERVED AREAS

6.1 Public risk

Some land managers have expressed the view that, because honeybees can sting people, and a few people can have severe allergenic reactions to bee venom, a public risk situation is created through the placement of commercial apiaries in conserved forests that are utilised by the general public.

6.2 Conflicting usage

Some people contend the placement of apiaries in conserved forests scares the public, giving rise to a conflict of use between commercial interests and the general public.

6.3 Damage to roads

Some land managers contend, because professional apiarists migrate their colonies with the aid of trucks, damage could be caused to forest roads.

6.4 Consistency

Some people contend, because apiarists depend on the availability of bee sites in conserved areas for income and livelihood, it may be inconsistent for land managers to allow apiculture to continue while excluding other industries, such as timber harvesting, grazing or mining.

6.5 AHBIC submits that any perceived usage conflict can be avoided through the development of sensible management guidelines through consultation with industry. This document, in Section 12 titled “Draft Code of Practice”, addresses this question.

AHBIC understands the desire for land managers to be seen to be consistent in their policies towards commercial public usage of conserved forests. AHBIC submits that apiculture cannot be shown to be destructive of native plants as can be shown with, for example, the extractive mining and timber industries or grazing. The need to extend the consistency philosophy to encompass apiculture is, therefore, greatly mitigated.

7. THE DISTINCTION BETWEEN FERAL AND COMMERCIALLY MANAGED HONEYBEE POPULATIONS.

7.1 There are two distinct categories of honeybees, *(Apis mellifera),* in Australia:

- Feral bees
- Commercially managed bees which are migrated periodically to floral sources that occur from time to time.

Both feral and commercially managed honeybee populations belong to the same species *(A. mellifera).*

As previously discussed, feral honeybees are present in most Australian forests and woodlands. Feral populations began to naturalise in Australian forests more than 180 years ago. It can be confidently expected that, in 2005, feral honeybee populations in Australian forests are in balance with the environment, and have been for a long time. It can be confidently expected that feral honeybees will continue to occupy a permanent niche in the Australian natural environment.

It therefore follows that, if there is an assumption that migratory managed honeybees adversely affect the environment, this assumption must also extend to the permanently resident feral honeybees.

The question which must be addressed, given first of all the assumption that honeybees adversely affect the environment is applicable, is whether or not additional honeybees migrated to sporadically occurring areas of nectar abundance poses any additional adverse impact on the environment.

AHBIC submits on the evidence, that even if impacts could be properly demonstrated, the long term impact of temporary, managed honeybee apiaries would be minimal, or absent.

It could be argued that, if for some natural reason, abundant nectar supplies decline following migration to a particular region, the short term presence of commercial apiaries, in addition to the resident feral population, may place additional stress on the environment. Under this situation, AHBIC submits that in the vast majority of cases, because it would not be economically viable for a commercial apiarist to remain in

that situation, the apiarist would be compelled to relocate the apiary elsewhere as soon as possible.

Commercially managed apiaries are sometimes located in Australian forests and heathlands during periods when the nectar and pollen flows are not sudden and copious, but which extend for some months in occasional seasons. Such situations are an exception rather than the rule. Again, economic signals to the apiarist expressed in terms of hive prosperity alert the apiarist to when it is time to remove apiaries from such areas.

8. HONEYBEES AND NATIVE FAUNA ECOLOGICAL NICHES

8.1 Honeybees and native fauna may sometimes occupy separate ecological niches in the same forest environment.

8.2 There is ample evidence (Shaffer et al, 1979) that many species of bees utilise different plant species, often without competition.

8.3 Honeybees are homeothermic in the nest, and can therefore forage at lower temperatures than most native species. Most species of Banksia worked by commercial beekeepers flower in winter when there would be little or no native bee activity.

8.4 Native Australian bees may be divided into two groups, that is the "short tongue bees" and the "long tongue bees". The length of the tongue determines what kind of plants the bee can effectively work.

Native long tongue bees may in some cases utilise flora that is never worked by honeybees.
The niche question would benefit from research designed to determine the range of native ground flora visited by honeybees, particularly when super abundant nectar conditions would be prevailing.

8.5 K. Walker, Assistant Curator of Insects, Museum of Victoria (pers. Com.) also reported the need to investigate the sugar types produced by various native plants. From a single eucalypt species located near a commercially managed apiary of 60 hives, Walker collected hundreds of native bees at different times of the day over a two day period, yet he did not trap a single honeybee. The exercise highlights the separate ecological niches which may be occupied by various species of bees. During his collecting experiences in Victoria, New South Wales and Queensland, Walker stated that he had never been consciously aware of competition between native bees and honeybees.

8.6 Honeyeaters (Pyke, 1983) utilise nectar sources with around 20% sucrose content. Such a sucrose content **is unattractive to honeybees.**

Good examples of honeybees not being attracted to low sugar content nectar secreted by native plants can be observed during flowering periods of some Banksias and Eucalypts, when nectar can be observed dripping from inflorescence onto leaves and onto the ground. In such situations, even though commercially managed honeybee apiaries may be present, honeybee activity on the flowers can be negligible.

However, in such obvious conditions of copious nectar secretion that is relatively unattractive to honeybees, considerable bird activity on the flowers is invariably noted. For example, in Victoria the foregoing situation may be noticed during some flowerings of iron back eucalyptus, and in New South Wales, flowerings of white box *(E. albens)* and spotted gum *(C. maculata).*

8.7 As previously discussed, eucalypt flowering periods are very sporadic, but honey flows from some species of this genera, sometimes only a few weeks in duration, can be very copious. Other native plant species worked by commercial apiarists which also have an irregular flowering pattern, but high nectar yielding characteristics, are the Banksias.

It is most unlikely that native melliferous fauna have evolved to rely heavily on eucalypt and banksia species for survival. It is more likely that native nectar and pollen feeders have evolved by utilising the more regular (annual) and sometimes longer flowering native ground flora usually flowering in spring or early summer. Eucalypts and Banksias rely on their copious nectar secretion to attract large pollinators such as flying foxes and migrant birds, often from outside the respective region.

8.8 Given the assumption that honeybees adversely affect the environment is applicable, then it could be argued that permanent feral honeybee populations have more effect on native fauna and flora than commercial apiarists which are migrated into areas for short periods. Given also that ground flora which flower for an extended period would be expected to have had native pollinators evolved with them, it could be argued, when resources are scarce, native fauna may be competing adversely with feral bees.

However, in addition to the studies referred to under 5.2, there is further evidence to suggest that this is not the case. Donovan (1980) discussing the impact of honeybees on native bees in New Zealand states: *"wide differences in the nesting requirements….indicates that there is little or no competition for this resource. Specialisation for different flowers and the coincidence of peak numbers of most native bees with nectar and pollen abundance reduces competition for resources… The ability of … native bees to outnumber introduced bees on many native and introduced flowers after 140 years of contact indicates that native bees are enjoying considerable competitive success"*. Similar views are held by Walker (pers. Com.).

The most extensive studies pertinent to this question have been presented by Roubik et al (1984, 1986, 1987).

The northward incursion of the Africanised bee through the neo tropical forests of Panama has provided a unique opportunity to study the effects of the honeybee, *Apis mellifera scutellate,* on the indigenous apoidian population.

In their 1986 study, Roubik et al demonstrated that: *"despite sharing most pollen resources and nectar of the same quality with the African honeybee, native stingless bees were largely unaffected by its activity".*
In their 1999 study, Boubik et al demonstrated that : *no measureable population impact of competition between these invading honey bees and native bees, despite many demonstrations of resource competition at flower patch or colony levels, changed abundance of all 15 species. Native Bee abundance did not decrease nor did native bees show substantial reciprocal change with honey bee abundance*

8.9 Clearly, the vast majority of food competition studies between feral honeybees and native bees, wherever they have been conducted in the world, have been unable to demonstrate significant adverse interactions. In view of the foregoing, AHBIC submits it is unlikely that migratory, commercially managed European honeybees, working under abundant honey flow conditions, would have any short or long term effects on the reproductive success of native bee genera.

AHBIC submits also that, in consideration of the foregoing:

- it is unlikely that migratory, commercially managed honeybees compete with other native fauna to any appreciable degree, and that even if there is short
- term minor competition, this is unlikely to have any adverse effect in the long term;
- it is highly unlikely that honeybees adversely affect the reproductive success of Eucalypts and Banksias, the main honey plant resources for commercial apiarists.

9. FURTHER RESEARCH

Data emerging from research conducted since 1990 has been very useful in contributing to knowledge about the interaction between managed honeybees and the natural environment. Research should continue to test the interaction.

AHBIC has always had difficulty with the findings of Pyke and Balzer (1982) (unpublished). This report contains gross statistical errors, errors in experimental design, and errors in interpretation. There is evidence that the authors were unable to recognise the smaller native bees as being bees, or that the mesh size used in their nets allowed these smaller insects to escape. Despite these serious inadequacies, the authors were unable to demonstrate any significant effect of honeybees on native bees. Regrettably, however, this report had been used to justify the development of policy to phase out beekeeping from conserved forests in New South Wales, and has had some influence in other States

AHBIC is very conscious of the concerns of some ecologists despite a lack of evidence for concern. As previously stated, AHBIC would particularly support further research designed to test the effects of commercial numbers of honeybees., working under heavy honeyflow conditions, on the reproductive success of native species of fauna, and the respective standing crops of nectar. O Seeman, University of Queensland, 1994, in a major revision of evidence, concludes that not enough evidence exists to reject the null hypothesis that *"managed hives have little or no long term impact on the environment"*. On the contrary, Seeman concludes that most of the available data suggests that any possible effects a migratory commercial apiary may have would be temporary.

10. REFERENCE AND WILDERNESS AREAS

10.1 Reference areas

Some governments and public land management authorities have set aside special areas which are not available for general access by the public. These areas are to be restored and maintained in as near a natural state as may be reasonably possible.

For example, in Victoria, the Land Conservation Act 1969 provided for the establishment of relatively small reference areas in Victorian forests, as standards against which ecological change in forests of similar type, used by the public, could be measured. Since 1969, the Land Conservation Council in Victoria, from time to time, recommended, and the Government accepted, the need to establish such areas throughout Victorian forests, with the result that today, most Victorian forest systems contain reference areas. The need to exclude members of the general public and industries from such relatively small areas is understood by AHBIC and it accepts such exclusion should extend to commercial beekeeping operations.
Future significant expansion in the relative size of reference areas and the creation of unrealistic buffer zones around reference areas, is viewed with concern by AHBIC unless compelling, special circumstances become applicable. Consultation with industry should be a prerequisite to the establishment of reference or similar type areas in all states.

10.2 Wilderness areas

AHBIC understands the philosophy which has led to the establishment of some wilderness areas in Australia and overseas. Up to 1986, the Australia beekeeping industry was able to live in reasonable comfort with the application of this philosophy.

This relative comfort rapidly changed in the face of directions to dramatically increase the area of wilderness areas in Australian forests, and to exclude commercial operations within such areas. The expansion of wilderness areas in some Australian forests has inevitably embraced land historically important for apiculture, to the detriment of industry where exclusion of apiculture from such areas has followed.

AHBIC submits proposals to establish or extend conserved forests, including wilderness areas, that will embrace historically important apiculture regions, should not proceed unless traditional access for beekeepers can be maintained or substituted. In every case, when proposals to expand conserved forest areas are being considered by respective State Governments, the value for apiculture of the region under review should be taken into account.

The correct identification of such land in Australia therefore assumes significance in this debate. Industry, through AHBIC, could be relied on to provide accurate assessments.

AHBIC submits the value to the community through food crop pollination of a viable Australian beekeeping industry far exceeds the income of industry members. It is in the wider community's best interests that, wherever possible, the traditional access for beekeepers to Australian forests be maintained.

AHBIC submits, on the basis of existing evidence regarding the impact of managed honeybees, buffer zones should not be prescribed around the boundaries of wilderness

11. TOWARDS A MANAGEMENT STRATEGY FOR COMMERCIALLY MANAGED HONEYBEES IN CONSERVED FORESTS

AHBIC acknowledges and supports the need for nature conservation and therefore sees management strategies designed to achieve such goals in the conserved forests of Australia as being highly desirable. As previously argued, AHBIC submits the impact of commercially managed honeybees over and above the impact of permanent feral honeybee populations in Australian conserved areas to be minimal. AHBIC submits that a strong case does not exist for management policies to be developed for conserved areas which excludes the operations of migratory, commercially managed apiaries. AHBIC accepts, however, that the day to day operations of beekeepers in conserved areas should be consistent with reasonable management guidelines. Accordingly, AHBIC proposes a draft code of practice for beekeepers in National Parks, nature reserves, and other conserved areas, to be adopted by respective authorities, enforced by rangers, and encouraged by AHBIC member bodies.

12. DRAFT CODE OF PRACTICE

12.1 Bee sites

Migratory, commercially managed honeybees should be permitted in National Parks, nature reserves and other conserved forests and lands, when there is the prospect of abundantly available nectar and/or pollen. Permanent sites are needed, not for permanent occupancy, but for permanency of tenure for the individual. Eucalypt species are notoriously sporadic in the time between their flowering periods, most

often years apart, and different species have different flowering periods during each calendar period. Beekeepers, therefore, need flexibility of occupation that is best served through the issue of licences/permits, on an annual basis.

AHBIC does not seek the establishment of permanent apiaries in conserved forests. AHBIC sees the establishment of such apiaries as not being compatible with industry objectives, nor with conserved forest management.

12.2 Fire control

Beekeepers should be aware of, responsive to, and accountable to management policies for fire precaution and suppression while occupying bee sites in conserved areas. Industry should be consulted by respective management authorities during the development of fire policies for beekeepers.

2.3 Fuel reduction burning

The industry understands the philosophy of fuel reduction burning in Australian public lands. Consultation between management and licensed apiarists should always take place during the early planning of such operations.

12.4 Public risk

Beekeepers should be encouraged to carry appropriate public risk insurance cover while occupying bee sites in conserved areas and other public lands.

12.5 Public relations

Bee sites should be located in conserved areas at places convenient both to the beekeeper and to the public. Management should consult and reach agreement with industry about guidelines for the placement of sites, to be implemented in the field following consultation on a management/individual basis.

12.6 Roads

Migratory beekeepers using National Parks and other conserved forests require reasonable access to be maintained to allow effective utilisation of respective areas.

In situations where bee sites are not serviced directly by made roads, access tracks should be provided by land management along routes acceptable to apiarists and management.

For example, along the coastal plain of SW Western Australia, beekeepers need to maintain, and in some cases, establish tracks to their sites in order to achieve acceptable access and the best usage of an area.

12.6 Rare and threatened native plants

The presence of rare and threatened native plants in any forest system should not be sufficient to exclude commercially managed honeybees from a given area. Apiary sites and tracks in most situations can be conveniently located or relocated to avoid damage to such plant species.

The presence of an apiary site, which may be occupied at very sporadic intervals by a commercial apiary, within foraging range of a rare and threatened plant species (and then usually under abundant nectar and pollen flow conditions originating from other plant species), would not place any additional downward pressure on the survival of such rare and threatened native plant species. In addition, site usage may not be coincidental with the threatened plant's flowering period.

12.7 Hygiene

The presence of plant pathogens in conserved forests (eg, SW Western Australia) should not be used to exclude commercial apiarists. Access conditions could be developed through consultation between management and industry.

2.8 Water near bee sites

Under some climatic conditions, it may be necessary for an apiarist to provide water for honeybees at bee sites. Under such conditions, the provision of water by an apiarist within 200 metres of an apiary should be permitted.

2.9 Camping

Migratory commercial beekeepers, while occupying sites within National Parks and other conserved forests with apiaries, should be allowed to camp on the site during apiary servicing operations. Beekeepers should be required to comply with reasonable management guidelines that would be developed through consultation with management.

2.10 Transfer of sites

Site conditions of occupancy should contain provisions which enable, with the consent of management, the formal transfer of occupancy between apiarists.

2.11 Penalties

Any apiarist who does not reasonably attempt to comply with all or any of the occupancy guidelines developed between management and industry should suffer appropriate penalty. The consequence of non compliance by an individual should not reflect on the industry as a whole in the form of loss of access by industry.

REFERENCES

BARLOW, BA (1959). Polyploidy and apomixis. In :The Casuarina distyla species Group", Aust J Bot 7: 238-251

BARLOW, BA (1983). Casuarina – a taxonomic and biogeographic review. In "Casuarina Ecology, Management and Utilisation: Proc. Int. Workshop, Canberra (1981), 10-18, CSIRO Melbourne.

BERNHARDT, P and WALKER, K (1984). Bee foraging on three sympatric species of Australian acacia Int. J Entomol. 26: 322-330.

BROWN, JH and KODRIC-BROWN, A (1979). Convergence, competition and mimicry in a temperate community of humming-bird pollinated flowers Ecology 60: 1022-1035.

CLEMSON, A (1985). Honey and Pollen Flora. Department of Agriculture NSW, Sydney.

DELL, B (1977). The collection of poplar rust spores by honeybees. West Aust. Nat. 13: 199-201

DONOVAN, BG (1980). Interactions between native and introduced bees in New Zealand, NZ J Ecol. 3: 104-106, 114

DOUGLAS, AM (1977). Some inimical effects of the domestic bee on the native flora and fauna. West Aust. Nat. 14: 1-2

EL-LAKANY, MH (1983). Breeding and Improving Casuarina in Casuarina Ecology, Management and Utilisation. Proc. Int. Workshop, Canberra (1981). 58-64

HAKESWOOD, TJ (1981). Notes on the pollination of Nuytsia floribunda (Labill.) R Br. (Loreanthaceae) and some literature reviewed. West Aust. Nat. 15: 949-963.

MATTHEWS, E (1984). To bee or not to be Bees in National Parks. Magazine of the SA National Parks Association.

MICHENER, CD (1974). The Social Behaviour of Bees, Harwood University Press, Massachusetts, USA. Page 140.

OLDROYD, BP (1985). Likely impact on the Australian honey industry from a reduction in Echium spp. In: IAC Report on Biological Control of Echium Species Including Paterson's Curse. Australian Government, Canberra.

Oldyord B P et al [1994]
Do Feral Honey Bees [apis Mellifera] and Regent Parrots compete for nest sites ? Australian Journal fo Ecology, 1994, 19, 444 - 450.

PATON, D (1979). The Behaviour and Feeding Ecology of the New England Honeyeater Phyliodonyris novaehollandiae in Victoria. Unpublished PhD Theses, Monash University.

PYKE, G and BALZER, L (1982). The effects of the introduced honeybee (Apis mellifera) on Australian native bees. Report prepared fro the NSW NPWS, Sydney.

PYKE, G, O'CONNOR, P and RECHER, H. Aust. Hournal of Ecology, 1993. Relationship between nectar production and yearly and spatial variation in density and nesting of resident honeyeaters in heathland near Sydney.

ROUBIK, D W – HENK WOLDA. [1999]
Do competing Honey Bees Matter ? Dynamics and abundance of native bees before and after Honey Bee invasion. Popul. Ecology, [2001] 43:53:-62.

SCHAFFER, WM, ZEH, DW, BUCHMANN, SL, KLEINHANS, S, SCHAFFER, MV and ANTRIM, J (1983). Competition for nectar between introduced honeybees and native north American bees and ants. Ecology 64: 564-577.

WILSON, PG (1970). A taxonomic revision of the genera Crowea, Eriostemon and Phebalium (Rutaceae). Nutysia 1: 3-155.

SEELEY, TD (1977). Measurement of next cavity volume by the honeybee (Apis mellifera). Behav. Ecol Sociobiol. 2: 201-227.

SEEMAN, O (1994). The University of Queensland. The Impact of Managed Honeybees on Native Australian Animals and Plants.

VON FRISCH, K (1954). The Dancing Bees. Harcourt Bruce, London.

AUSTRALIAN HONEY BEE INDUSTRY COUNCIL Inc.
MEMBER BODIES and ADDRESSES.

HONEY PRODUCTION SECTOR.

Mrs Elwyne Papworth
Secretary,
Federal Council of Australian Apiarists' Association Inc.
RSD 7440
Northern Highway
Strathallan. Victoria. 3622.
Ph. 03 5484 9231. Fax. 03 5484 9231.
Email amberhunidue@bigpond.com

New South Wales Apiarists' Association Inc.

Secretary.
Julie Lockhart,
P O Box. 3018.
Toongabbie, NSW. 2146.
Ph. 02 9631 3934. Fax. 02 9631 0585.
Email. nswaa@bigpond.net.au

Queensland Beekeepers' Association Inc.

Secretary
Bob Johnson.
P O Box. 49.
Mapleton. Qld. 4560.
Ph. 07 5445 7512. Fax. 07 5478 6880.
Email. qqba@hypermax.net.au

Victorian Apiarists' Association Inc.

Secretary.
Kerrin Williams
P O Box. 40.
California Gully. Vic. 3556.
Ph. 03 5446 1455. Fax. 03 5446 1543.
Email. vaa@bordernet.com.au

Tasmanian Beekeeper's Association inc.

Secretary
P Ewington.
16826. Bass Highway.
Flowerdale, Tasmania. 7321. Ph. 03 6442 3916. Fax. 03 6442 1508.
Email. maxewing@bigpond.com

HONEY PRODUCTION SECTOR Continued.

South Australian Apiarists' Association Inc.

Secretary.
Bronwen Lawrence.
P O Box. 293.
Tintinara. South. Australia. 5266.
Ph. 08 8757 2001. Fax. 08 8757 2102.
Email. secretary@saaa.org.au

Western Australian. Farmers' Federation Inc.

Executive Officer.
Lucy Beckwith.
P O Box. 6291.
East Perth. West Australia. 6892.
Ph. 08 9325 2933 Fax. 08 9325 4197.
Email. lucybeckwith@waff.org.au

HONEY BEE QUEEN PRODUCTION SECTOR.

Australian Queen Bee Breeders' Association Inc.
Mrs. P Dewar.
2157. Lake Moogerah Road
Kalbar. Queensland 4309.
Ph 07 5463 5633. Fax. 07 5463 5619.
Email dewar@hypermax.net.au

CROP POLLINATION SECTORS.

Western Australia.

Secretary.
Pollination Association of Western Australia.
David Leyland.
285. Leyland Close.
Beechina. W. Australia. 6556.
Ph. 08 9572 6116.

CROP POLLINATION SECTOR continued.

Tasmania.

Secretary
Tasmania Crop Pollination Association Inc.
Julie Hoskinson.
159. Woodbridge Hill Road.
Woodbridge. Tasmania. 7162.
Ph. 03 6267 6449. Fax, 03 6267 4633.
Email. miellerie@dodo.com.au

Crop Pollination Association Inc. [South Australia, Victoria, New South Wales]

Secretary.
Elwyne Papworth
RSD. 7440.
Northern Highway.
Strathallan. Victoria. 3622.
Ph/fax. . 03 5484 9231.
Email. amberhunidue@bigpond.com

National Crop Pollination Association Inc.

Up to date contact information available from,
Secretary
Australian Honey Bee Industry Council
Ph. 02 9221 0911. Fax. 02 9221 0922 or.
Email. ahbic@honeybee.org.au

HONEY PACKING SECTOR

Secretary.
Honey Packers' and Marketers' Association Inc.
Kevin G Webb.
Spring Gully Pickles Pty. Ltd.
184 Cavan Road.
Dry Creek. South Australia. 5094.
Ph. 08 8262 7555. Fax. 08 8262 7127.
Email. Kevin.webb@springully.com.au

FOREWORD.

In 1985, the apiculture [beekeeping] industry national peak body resolved to formulate a nationally uniform policy regarding the working of Australian conserved forests by managed honey bees.

In 1987, the study, Honey Bees in Australian Conserved Forests, authored by J.L. Briggs and D.G. Keith, was adopted by the peak body as national policy.

The authors continue to acknowledge the significant contribution to the study provided by Dr B Oldroyd, Genetics Faculty, University of Sydney, whose understanding of the issues and scientific rigour became important elements in the exercise.

In 1996, the policy was reviewed and updated by the peak body, in consultation with the authors.

Following further review and updating in 2005, the policy was again endorsed at the Australian Honey Bee Industry Council Annual Meeting in July, 2005.

.