AUSTRALIA'S

HONEYBEE NEWS

"The Voice of the Beekeeper"

Volume 9 Number 1
January-February 2016

www.nswaa.com.au

AUSTRALIA'S HONEYBEE NEWS

The official Journal of the NSW Apiarists' Association (NSWAA) www.nswaa.com.au

Published Bi-Monthly **Email:** honeybeenews@bigpond.com **ISSN 1835 6621**

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COVER: Bees working Coolibah south of Lough on the Darling River PHOTO :Bryn Jones

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Printer: **Farrell Printers 13 Ralph Street, Alexandria NSW 2015**
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- WFI - Insurance for Rural Business, Business & Strata – 1300 934 934. WFI provides commission to NSW Apiarists' Association (NSWAA) to help member benefits. Please let your local Area Manager know that you are a member to receive this benefit for the Association. - Ms Jane Hayes Mob: 0417 943 451 E: jane.hayes@wfi.com.au
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HONEY PACKERS & MARKETERS ASSOCIATION (HPMAA)
Secretary: Mr Ross Christiansen Email: ross@superbee.com.au

PRESIDENT'S REPORT

The New Year is well underway with rain falling over many districts, a saviour for some, while causing some setbacks for others, especially those fortunate enough to be on honey flows. Some short budders have set buds for autumn and hopefully climatic conditions are favourable for a crop to be produced.

It was extremely disappointing to see all the negative press during late January and hope the media sensationalism does not have any severe long term effects on honey sales.

BEEKEEPING EDUCATION OFFICER
Elizabeth Frost has returned from California to take up a position as the Education Officer Beekeeping based at Tocal Agricultural College. Elizabeth will be responsible for constructing a training package to cover a full certificate in beekeeping. This is a new position and very much puts the focus on meeting the shortfall in the available training options for beekeepers. Her contact details are Ph: 02 4939 8821 or email elizabeth.frost@dpi.nsw.gov.au. Elizabeth is also the chairperson of the AHBIC education committee. It is pleasing to see this area of the industry now in the hands of a very enthusiastic and capable person. We wish Elizabeth all the best for her interactions with the beekeeping industry and encourage all beekeepers and members to assist her where ever possible.

APIARY SITE WORKING GROUP
Minister Andrew Constance stated at our conference last July that an all of government approach to bee sites on public lands was a no brainier. Since then the process of making this happen has been painfully slow. The first meeting of the committee of government departments and industry did not happen until 13 November at Dubbo. A follow up phone conference was to occur in mid-December but this failed to eventuate. We understand that the chair of the November meeting no longer holds her original position and as such it would appear as the committee is now directionless. As of mid-January we still haven't received any notification of the next meeting or any progress with our stated goal of an all of government approach to bee sites on public lands.

FORESTRY CORPORATION
As a result of the Beekeeping Access to Public Lands Committee on 13 November myself, Casey Cooper and Greg Roberts met with Forestry at Dubbo on 8 December. The meeting was at the Forestry Corporations request but was a very disappointing event. The management of the Forestry Corporation seem to have no intention of involving themselves in an all of government approach to bee sites on public lands and have no intention of shifting from this position.

RESOURCE FUNDING
Your Executive have made available an avenue whereby members may donate their excess funds to a Resource Fund. Funds raised will then be used as required to provide resources outsourced by your Executive committee. Details are provided in this edition.

MINISTER FOR PRIMARY INDUSTRIES
Due to the clear belligerence expressed from the Forestry Corporation and the lack of action with the all of government approach to bee sites on public lands, the industry has been trying to secure a meeting with the Minister for Primary Industries, the Hon Niall Blair. Unfortunately at the time of writing this report we have not been successful in being able to secure a meeting. This could be due to the holiday/ Christmas period. Hopefully by my next report we will have more positive news to report.

BUSINESS PLAN
Your executive have recently completed our Business Plan which sets out our Associations goals and priorities. This is a five year plan but will be reviewed annually. All Branches have received copies and it is also on our website under the resource menu.

CONSTITUTIONAL AMENDMENTS
Several proposed constitutional amendments are included in this edition, which I hope will gain members endorsement at our Conference in May.

Some explanatory notes for amendments to Branch rebates in 17g. The reasoning behind the fee rise was to increase funds enabling your Association to operate effectively and meet industry challenges as they occur.

Under the new proposal Branches will receive increased rebates from base members and have a set rate of $30 from members with over 200 hives.

Proposed changes are:
Fees paid to branches will be at the following rate:
200 hives and less - $10 per member
201+ $30 per member.
This can be subject to CPI increases

NATIONAL PARK APIARY SITE REALLOCATION
Details of the sites to be returned to industry are included in this edition and on our website.

It is proposed that NSWAA will conduct a ballot on 22 March 2016 following our Executive meeting in Sydney.

To be included in the ballot you must submit your:
NAME and CONTACT details
NSW APIARY REGO No.
All Bee Site Identification Numbers [of sites you wish to be in ballot for]

These details MUST be received by our secretary NO later than close of business Friday 11 March 2016. Contact details are: NSW Apiarists' Association - Kate McGilvray, email: info@nswaa.com.au or mail to: PO Box 833 MUDGEE NSW 2850

BEE BIOSECURITY OFFICER
Yet another phase in the selection process aimed at eventually employing our Bee Biosecurity Officer occurred on 28 January in Orange where face to face interviews took place.

Vice-President Casey Cooper has spent many hours working toward gaining the best available candidate to fill this important role, progress is slow to say the least , but I expect the position filled soon.

PESTICIDES and BEE DEATHS
Anyone experiencing any bee kills or die-offs that cannot be explained from disease or pest problems should contact the Environmental Protection Agency ASAP so they are aware of the kill event. Their number is 131 555. Any suspect pesticide poisonings should be notified to the EPA. Time is important as the offending chemicals will break down and in some case quite quickly. The NSW Apiarists' Association Executive would also be grateful to be kept informed of any pesticide poisoning events affecting bees.

HONEYLAND
As the Sydney Show dates draw nearer we are still hoping for your generous support by volunteering to help man the Honeyland stand and promote our industry to the general public. The show runs from 17 March thru 30 March. Anyone wishing to volunteer please contact Show coordinator Bruce White at email brucesown@outlook.com or phone 02 9634 6792.

CONFERENCE
Included in this edition is a draft Agenda as well as a Registration Form for the 2106 Annual State Conference to be held on 12 & 13 May at the Commercial Club, Dean Street Albury.

MARCUS OLDHAM RURAL LEADERSHIP PROGRAM
Each year your Association sponsors a member to participate in the Marcus Oldham Leadership program which is held in June. If you are interested or know of an industry member you think would be interested in attending this year, please contact our secretary Kate McGilvray at info@nswaa.com.au.

VALE
Our industry has lost another member with the passing of Sterling Kershaw, a long-time member and family friend. On behalf of the Executive committee and Association members I wish to offer our sincere condolences to the Kershaw family.

Neil Bingley
State President

NEW MEMBERS

A warm welcome to the following new members:

Sarah Gledhill	Blacktown
Tim Kotlar	Schofields
Jeffrey Matsen	Bywong
Luke Morrison	Richlands QLD
Dougal Munro	Orange
Karen Simpson	Lagoongrass
Jacob Sykes	Dubbo

NSWAA RESOURCE FUND

The NSW Apiarists' Association Executive have established the *NSWAA Resource Fund* to help finance special activities needed for tackling the key priority for our members - working for fair and secure access to essential floral resources held within public lands.

Our overarching goal is to achieve favourable apiculture policies with all public land managers, including NSW Forestry Corporation, NSW National Parks and Local Land Services.

We are striving for an overall NSW state policy for commercial beekeeping on public lands, which is favourable to our needs, and that will help to enable our members to maintain sustainable beekeeping businesses.

However, due to continuously shifting government agendas and departments, this is an ongoing battle that does not have a short-term solution, and the Executive is committed to continuing to fight for our members.

For example, we are currently meeting frequently with various representatives from the NSW State Forests, National Parks and Local Land Services and other public lands managers. We are also strongly advocating for our members, via the Apiary Site Working Group (chaired by the Department of Primary Industries), and we are seeking meetings with the NSW Minister for Primary Industries to progress our agenda. We are also using a media consultant to raise our profile with the public, which helps bring political pressure to bear in our favour.

We are accepting gifts/donations into the Resources Fund. Please consider a gift/donation so that you can help support our work towards fair access to public lands for NSW Apiarists' Association members.

Please contact our Secretary if you would like details on how to provide funds to the NSWAA's Resource Fund.

CONFERENCE ACCOMMODATION

A special accommodation rate has been organised for conference delegates at the Atura Albury.
The hotel is conveniently located opposite the conference venue.

To book a room please call reception 02 6021 5366 and advise that you are attending the NSW Apiarists' function to receive the special rate.
www.aturaalbury.com.au

SYDNEY EASTER SHOW

Volunteers for Honeyland are still needed for the 2016 Sydney Show which runs from

17 March -30 March 2016

If you would like to help you will be very welcome. Entry ticket is provided + free time for exploring the Show is arranged.

Contact: **BRUCE WHITE**
SHOW COORDINATOR
Phone: 02 9634 6792
Email: brucesown@outlook.com.au

PROPOSED CONSTITUTIONAL MOTIONS FOR 2016 AGM

PROPOSED MOTION 1

'That the proposed amendments to the Association's constitution as advised below be accepted by the members.'

7h

Current	Proposed
The President, and in his absence the Vice-President, shall preside at all Meetings of the Executive Council and Conferences and at all Meetings, the Officer presiding shall have a deliberate and casting vote.	The President, and in their absence the Vice-President, shall preside at all Meetings of the Executive Council and at all Meetings, the Officer presiding shall have a deliberate and casting vote. Executive Councillors may, at the request of the President, chair sessions at Conferences.

9b

Current	Proposed
The rate of the Annual Subscription shall be calculated on the basis of the Member's ownership or control of hives of bees as follows: Affiliated/Retired/Student 1 vote 0 to 10 hives 1 vote 11 to 200 hives 2 votes 201 to 400 hives 4 votes 401 to 700 hives 6 votes 701 to 1000 hives 8 votes 1001 to 1500 hives 10 votes Over 1500 hives 12 votes LIFE maximum number of votes	The rate of the Annual Subscription shall be calculated on the basis of the Member's ownership or control of hives of bees as follows: Affiliated/Retired/Student 1 vote 0 to 10 hives 1 vote 11 to 200 hives 2 votes 201 to 400 hives 4 votes 401 to 700 hives 6 votes 701 to 1000 hives 8 votes 1001 to 1500 hives 10 votes 1501 to 2000 hives 12 votes 2000+ hives 14 votes LIFE 12 votes

Section 10h

Current	Proposed
All questions at Conference, or other meetings may be decided by a show of hands but, on the demand of 12 Financial Members, a Ballot shall be taken in which the voting power shall be on the basis of: Affiliated/Retired/Student 1 vote 0 to 10 hives 1 votes 11 to 200 hives 2 votes 201 to 400 hives 4 votes 401 to 700 hives 6 votes 701 to 1000 hives 8 votes 1001 to 1500 hives 10 votes Over 1500 hives 12 votes LIFE maximum number of votes This voting power shall also apply in all polls and postal ballots.	All questions at Conference, or other meetings may be decided by a show of hands but, on the demand of 12 Financial Members, a Ballot shall be taken in which the voting power shall be on the basis of: Affiliated/Retired/Student 1 vote 0 to 10 hives 1 votes 11 to 200 hives 2 votes 201 to 400 hives 4 votes 401 to 700 hives 6 votes 701 to 1000 hives 8 votes 1001 to 1500 hives 10 votes 1501 to 2000 hives 12 votes 2000+ hives 14 votes LIFE 12 votes This voting power shall also apply in all polls and postal ballots.

Section 17g

Current	Proposed
Each branch shall receive 10% from the subscription of each member of that branch.	In any given financial year each branch shall receive a rebate from the subscription of each member of that branch at the following rate: Fees paid to branches will be at the following rate: • 200 hives and less - $10 per member • 201+ $30 per member. This can be subject to CPI increases.

PROPOSED MOTION 2

'That the 0-10 hive category in Section 9b and Section 10h of the Association constitution be amended to read 1-10 hives.'

DOUG'S COLUMN

Doug Somerville
Technical Specialist, Apiculture - NSW Department of Primary Industries - Goulburn
doug.somerville@dpi.nsw.gov.au

POOR-PERFORMING BEES

In 2015 there were several reports received where beekeepers were experiencing poor-performing colonies or, in some cases, where colonies were just dying. There was nothing sinister about these reports and there was no suggestion that varroa was in the country and we weren't aware of it. There is always the question of why and what could it have been? I've heard much discussion about what contributed to this event and I think many beekeepers have already concluded what they believe caused the death or poor performance of the colonies they were managing.

A few beekeepers made mention of pesticides but, generally speaking, it was viewed as multi-factor causes.

Issues that contribute to the stress on beehives include: poor nutrition, pest and diseases, pesticide exposure, significant environmental extremes and the poor performance of the queen. A poor-performing colony could be attributed to any one of these issues or, more likely, due to a range of issues combining to cause poor performance or death of the colony.

For instance, a colony experiencing poor nutrition could also experience higher levels of nosema. The higher levels of nosema will reduce the life span of the field bees and lower their numbers. This reduces the ability of the colony to forage for good-quality pollen to feed to the brood to overcome the disease. Continuing poor disease because of lack of field bees or lack of good nutrition (pollen) in the field, or an old or non-performing queen may eventually lead to the death of a colony. So, not one single factor, but a range of factors. During this whole process, which could take several months, if a colony is then exposed to a sub-lethal level of pesticide this then could be the 'straw that broke the camel's back'.

Let's look at each one of these areas.

Nutrition of bee colonies has been investigated extensively by several researchers. There are still a number of areas that are not understood about bee nutrition, but there is also a lot we know about honey bee requirements. Bees require significant quantities of pollen, (estimates are in excess of 50kg of pollen per year per hive) particularly if a colony is being transported around the countryside and the queen is continuing to lay eggs at a high rate throughout most of the year. Pollen contains the crude protein, amino acids, fatty acids, lipids, vitamins and minerals that bees need to raise larvae and replace bees in the hive.

Pollen that's collected from specific species can vary in relation to all those nutrient components. The primary one we focus on to determine whether pollen is highly desirable or poor quality is the crude protein level. Protein levels around 20% or less are regarded as average to poor, levels around 25% are regarded as quite good and around 30% are regarded as excellent.

White box and grey box pollen is regarded as poor – it is in the 20% crude protein or less range. Species such as red gum or one of the eucalypts belonging to the red gum group are in the middle (good) category. Banksia, spotted gum and Paterson's curse are all in the 30% range and are regarded as excellent. Interestingly, some of the best honey plants that beekeepers pursue, such as box and ironbark in the eucalypt group, traditionally do not produce any pollen that is attractive to bees, such as yellow box, or the pollen that they do produce is regarded as average or poor quality such as the white and grey box already mentioned.

The issue with nutrition is the bee colony can visually look in reasonable condition, but if the nutritional inputs into that hive are diminishing, then it may take a few generations before the bee colony seriously declines in population. It is also an interesting point to note at this stage of the discussion that many beekeepers, when they see the visual impact of poor nutrition occurring to a hive, begin to think about supplementary feeding. Ironically, this is frequently too late as the overall welfare of the colony will be difficult to turn at this point.

The other obvious issue that affects bee health is **pests and diseases**. A study funded by the Rural Industries Research and Development Corporation released in 2015, found that Australia has "one of the healthiest honey bee populations in the world". Now I know many beekeepers will question this, but we don't have varroa mites and that makes the difference.

There are many pests and diseases Australian honey bees are subject to, including AFB, EFB, chalkbrood and sac brood. Pests such as small hive beetles are a major problem where apiaries experience high humidity and high temperature combinations.

As far as colony performance, nosema would be the stand-out microbe that affects the longevity of bees and the productivity of the whole apiary. Nosema is a microbe that infects the gut of a bee and effectively reduces the bee's ability to absorb nutrients. The microbe's presence will reduce the lifespan of adult bees by over half. Therefore a colony may not expand, or may even dwindle in numbers, if this disease is prevalent or in significant numbers. This particular disease is far more common in nutritionally stressed bee colonies than well fed colonies. With bees working species such as spotted gum, which produces a high quality pollen (crude protein level of 30%), it is not unusual to find high levels of nosema in those bees, as spotted gum is a winter flowering plant. The high protein pollen counteracts the effect of nosema, so we do not normally see colonies performing poorly because of the positive effects of the high protein level of spotted gum pollen.

Colonies infected with nosema show very few visual symptoms of the disease, which makes it very difficult to clearly identify it in the field as the causal agent of poor performing colonies. We now have two species of nosema – *Nosema apis* and *Nosema ceranae*. It is believed that *Nosema ceranae* possibly entered Australian bees within the last 10 years. *Nosema apis* is traditionally a disease of bees through the cooler months, *Nosema ceranae* would appear to have a bigger impact on bees in the spring and warmer months. This disease becomes a major problem because beekeepers are not aware they actually have the disease. The impact of the disease is certainly reflected in the status of the colony and the ability of the colony to grow and prosper.

Queen performance could also be an initial cause of poor performing colonies. If a bee colony is infected with nosema, it is possible that the queen may also be infected. In this case it may lead to the supersedure of the queen and the colony replacing the existing queen. Frequently queen performance relates back to the initial breeding and management of the young queen in the mating phase, and management of the queen in the nucs. It always pays commercially to replace poor performing queens.

Combined with these major issues impacting bees are **pesticides**. While pesticides do attract a lot of negative attention by beekeepers and the media, the Australian beekeeping industry does not apply any varroa treatments to hives. Thus far, Australia is still free of varroa. Therefore we do not have the accumulation of the arachnicides, the chemicals used to control varroa, building up in our colonies. Our pesticide exposure in the Australian context resides with any crops that the bee colonies are placed near.

Almond pollination is becoming a bigger event in the beekeeping calendar, where many tens of thousands of bee colonies are transported into the southern areas of NSW, Victoria and South Australia to pollinate almonds at the beginning of August each year. There is some concern that the fungicides used at blossom time on almonds may have some impact on bees. Generally, the tests for the effects of fungicide on bees do not show a significant lethal effect. The issue is that beekeepers are concerned with is the sub-lethal effects that these chemicals are having on their bees and brood.

After almond blossom comes canola. While most beekeepers do not receive any financial payments for placing beehives on canola crops, it is hard for beekeepers to avoid their bees coming in contact with canola blossom. Canola flowers in the late August-September period and is extremely attractive to bees, producing significant quantities of nectar and pollen. Bee colonies generally do well on canola. There is a world-wide focus on the neonicotinoid seed treated canola and its potential sub-lethal impact on bees. This may well be a topic that Australian beekeepers should be seriously concerned about, particularly if combined with nosema infection and poor nutrition.

The question remains – are pesticides the sole reason why we see large numbers of poor performing bee colonies in some years?

The general thinking is that, in most cases, poor performing colonies in spring relate back to autumn management, particularly the nutrition intake the colonies are exposed to at that time of year. It is critically important that colonies are headed by a strongly performing queen and are free of any major pest and diseases at that stage of the calendar.

This article does not point a finger at any specific cause and effect, my belief is that many of the issues affecting bee colonies in Australia and around the world are due to a multiple set of factors and poor nutrition is playing a major role in that story.

(Acknowledgements: Vicki Saville for typing this article and Annette Somerville for proof reading)

AUSTRALIAN HONEYS ARE HEALTHY

Media Release from the NSW Apiarists' Association, 21 January 2016

In response to the recent widespread media coverage of an international scientific study (Griffin et al. 2015) that found Australian honeys contained naturally-occurring pyrrolizidine alkaloids (PAs), and in support of the media statement from the Australian Honey Bee Industry Council (AHBIC) on 21 Jan 2016:

- There is no evidence that consumption of Australian honeys causes human harm. In fact numerous other recent scientific studies have demonstrated likely health benefits associated with Australian honey, including antibiotic activity, anti-fungal activity, prebiotic activity and inhibitory activity against viruses such as influenza. Far from being considered a carcinogen, honey is even sometimes used to help manage side-effects of cancer treatments.

- A soon-to-be-published report from the Rural Industries Research & Development Council will show that in terms of chemical contamination, Australian honey is some of the cleanest and purest in the world.

- The naturally-occurring substance (PA) detected in Australian honeys in the study by Griffin et al. (2015) is introduced into the honey when bees forage on flowers of noxious introduced weeds such as Paterson's Curse.

- All Australian honey samples tested by Griffin et al. (2015) were produced before 2012, some even before 2008. Since then the proportion of bees foraging on Paterson's Curse in Australia has dropped significantly as efforts to control this noxious introduced weed have become more and more successful. By late 2015 it has been estimated that less than 0.001% of the commercial Australian honey crop involved nectar or pollen from Paterson's Curse.

- 70-80% of Australian/NSW honey is produced by bees foraging on native flowering plants such as eucalypts. Eucalypts do not produce PAs.

- All of this adds even more weight to why Australian beekeepers need better access to good native floral resources.

- Honey in NSW is produced in compliance with Australian standards and recommendations.

- The Australian and international standards for food PA content are currently under review by experts. It should be noted that according to Griffin et al. (2015) even most European-produced honeys don't meet the current European guidelines for PA content.

For further details please contact:

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Technical Specialist Honey Bees
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VALE

Stirling (Sterl) Kershaw 1928-2016)

Well-known Sutton (NSW) beekeeper Sterl Kershaw was farewelled by a very large group of relatives, friends and fellow beekeepers on 19 January in Queanbeyan. Acknowledged by many as an innovative and dedicated beekeeper/farmer, Sterl lived his life at 'Wattle Valley', between Gundaroo and Bungendore.

Stirling had a clever and inquiring mind and was always cheeky and full of life. He was a master of looking at something that needed improving, thinking about it and the turning new ideas into innovations. He was the first with so many things; he fitted levelling devices to bobcats, forks that moved up and down to bee barrows, made sloping bottom boards, cross ventilated lids and invented the "Kershaw pallet". He thought about things and dared to do things differently. He willingly shared his ideas and was always happy to offer help to others. So much so that many of his good ideas have become standard industry practices and technologies.

He was undoubtedly the "heart" of the Kershaw family's 5th generation history in bees. He was the anchor pin between earlier Kershaws who worked by hand to pioneer beekeeping in Australia and a modern, world class beekeeping operation that is the Kershaw operation today. Stirling's heart radiated a genuine passion for bees, a special love for his most cherished asset in Barb and a quiet pride in his family and accomplishments.

Sterl was an inspiration to all in the industry. He felt that due to his lack of formal education he didn't have much to offer, however he grew up during the Depression and the War; despite being threatened by fire and floods he only ever lost hives of bees from orchard spraying. Sterl worked with a range of equipment and materials throughout the years and was never been afraid to upgrade to the standard of the era.

Sterl had a genuine, unobtrusive, warm and friendly presence but he did have a "Stirling way" at times. He took pride in everything he did and expected others around him to do things the Sterling way or the right way. Boxes and lids had to be straight when unloaded, every bee box was drilled, nail dipped in glue and hand nailed. If the technology of the nail gum didn't produce a better result, then he wouldn't use it. His results speak for themselves. Never in Australia would you see a better presented or better run beekeeping enterprise than the Kershaw operation. It's what every other beekeeping family silently aspires to live up to and achieve.

His ties to the local community were borne out by the honour guard of local RFS volunteers from the Sutton and Gundaroo Brigades, and by the number of Sterl's fellow students from Sutton Primary School who attended the service.

Des Cannon

WORK WANTED

I am a motivated and open-minded boy from Weisswasser, Germany. I arrived in Australia on the 27 October 2015.

I would like to gain more experience in the agricultural sector in Australia and improve my English skills. In Germany I am in an integrated degree program in agriculture. In Australia I have a working holiday visa and I would like get experience with honeybees.

At the moment I look for a job anywhere in New South Wales, 300 km west to 300 km south. (I have a car and an international driving license.)

Toni Hanske Email: hansketoni@web.de

NPWS APIARY SITES BALLOT

The following apiary sites are to be balloted by the NSWAA on the 22 March 2016
Please refer any site specific questions to the NPWS District office listed on vacant site schedule

To be included in the ballot you must submit your:

BeeSite Identifier	Topographic Map Name	Topographic Map Number	Map Zone	Datum GDA94	Longitude GDA94	Latitude GDA94
euro.old2	Narooma	89254S	56	GDA94	150.120344	-36.144421
euro.old3	Central Tilba	89253N	56	GDA94	150.131418	-36.267252
koor.32	Wandella	88252N	55	GDA94	149.945903	-36.335738
N0026-C0008	Bulahdelah	93333S	56	GDA94	152.120301	-32.470006
N0026-C0009	Bulahdelah	93333S	56	GDA94	152.121994	-32.485227
N0026-C0010	Bulahdelah	93333S	56	GDA94	152.109071	-32.499691
N0026-C0015	Bulahdelah	93333S	56	GDA94	152.216423	-32.485995
N0026-C0016	Wootton	93332N	56	GDA94	152.292133	-32.366772
N0026-C0018	Bulahdelah	93333S	56	GDA94	152.095375	-32.441667
N0041-C0122	Banyabba	95393N	56	GDA94	153.215635	-29.252088
N0041-C0123	Banyabba	95393N	56	GDA94	153.231405	-29.258309
N0041-C0131	Banyabba	95393N	56	GDA94	153.214401	-29.263382
N0063-N/A	CUDAL	8631S	55			
N0068-C0163	Red Rock	95383S	56	GDA94	153.238987	-29.960008
N0089-C0042	Raleigh	95373S	56	GDA94	153.052770	-30.400279
N0092-C0061	Afterlee	94401N	56	GDA94	152.755588	-28.519747
N0092-C2179	Woodenbong	94413S	56	GDA94	152.654971	-28.479081
N0092-C2314	Grevillia	94412S	56	GDA94	152.851488	-28.493700
N0097-C0016	Burringbar	95412S	56	GDA94	153.414662	-28.437274
N0097-C0017	Burringbar	95412S	56	GDA94	153.408541	-28.439098
N0104-C0012	Nymboida	94383S	56	GDA94	152.571198903 change to 152.572146	.-29.9083942485 change to -29.908176

* **NAME and CONTACT details**
* **NSW APIARY REGO No.**
* **All Bee Site Identification Numbers [of sites you wish to be in ballot for]**

These details MUST be received by our secretary NO later than close of business Friday 11 March 2016.
Contact details are: NSW Apiarists' Association - Kate McGilvray Email: info@nswaa.com.au
OR Post: PO Box 833 MUDGEE NSW 2850

Specified Access	Park Name	Nearest town with NPWS office	Contact Number
Brou Lake Road	Eurobodalla National Park	Narooma	(02) 4476 0800
Bogola Head Road	Eurobodalla National Park	Narooma	(02) 4476 0800
Narira Road	Kooraban National Park	Narooma	(02) 4476 0800
Boundary Road, site located within old log dump	Myall Lakes National Park	Pacific Palms	(02) 6591 0300
Boundary Road, near intersection with Skid Hill Road	Myall Lakes National Park	Pacific Palms	(02) 6591 0300
Boundary Road	Myall Lakes National Park	Pacific Palms	(02) 6591 0300
Burdekins Road to private property (locked gate) to park and along northern park boundary to powerline	Myall Lakes National Park	Pacific Palms	(02) 6591 0300
Stoney Creek Road within Myall Lakes National Park	Myall Lakes National Park	Pacific Palms	(02) 6591 0300
Booral Road to Jarrah Road	Myall Lakes National Park	Pacific Palms	(02) 6591 0300
Bundjalung NP RFA addition western side of Pacific Highway, western side of Pine Road approx. 1.01km south of northern boundary.	Bundjalung National Park	Grafton	(02) 6641 1500
Bundjalung NP RFA addition central eastern boundary area adjacent to Pacific Highway along Waynes Lane parallel to hwy.	Bundjalung National Park	Grafton	(02) 6641 1500
Bundjalung NP RFA addition central area of addition along the western side of the Pine Road Extension. 375m south along this road from the intersection with Pine Road.	Bundjalung National Park	Grafton	(02) 6641 1500
Set Down Site To Be Determined	Nangar National Park	Bathurst	(02) 6332 7640
Pebbly trail	Yuraygir National Park	Coffs Harbour	(02) 6652 0900
Swamp Rd, Bongil	Bongil Bongil National Park	Coffs Harbour	(02) 6652 0900
Toonumbar NP. Iron Pot Road (Murray Scrub Road).	Toonumbar National Park	Kyogle	(02) 6632 0000
North Yabbra Road	Toonumbar National Park	Kyogle	(02) 6632 0000
Toonumbar Scenic Drive Roseberry O'Donnell Creek Trail.	Toonumbar National Park	Kyogle	(02) 6632 0000
Baratta Rd Mt Jerusalem NP	Mount Jerusalem National Park	Kyogle	(02) 6632 0000
Baratta Rd Mt Jerusalem NP	Mount Jerusalem National Park	Kyogle	(02) 6632 0000
Marara road	Chaelundi National Park	Dorrigo	(02) 6657 2309

BeeSite Identifier	Topographic Map Name	Topographic Map Number	Map Zone	Datum GDA94	Longitude GDA94	Latitude GDA94
N0104-C0013	Nymboida	94383S	56	GDA94	152.588779523 change to 152.581707	.-29.912962541 change to -29.912265
N0110-C0502	BONALBO	94404S	56			
N0124-C0212	Kundabung	94351S	56	GDA94	152.774504	-31.138850
N0124-C0213	Kundabung	94351S	56	GDA94	152.793372	-31.145197
N0125-C0001	Warranulla	93334S	56	GDA94	152.118455	-32.212168
N0136-C0016	Ellangowan	95394N	56	GDA94	153.171566	-29.047140
N0136-C0020	Ellangowan	95394N	56	GDA94	153.152149	-29.055249
N0145-C0012	Burringbar	95412S	56	GDA94	153.456282	-28.379371
N0148-C0002	Yates Flat	94394N	56	GDA94	152.683812	-29.005932
N0154-C2232	Tooloom	93401N	56	GDA94	152.490461	-28.609176
N0183-C0741	Brays Creek	95413S	56	GDA94	153.240671	-28.379058
N0267-C0090	Gibberagee	95394S	56	GDA94	153.181830	-29.206337
N0731-C0001	Missabotti	94361N	56	GDA94	152.899467	-30.532912
N0733-C0002	Telegraph Point	94352N	56	GDA94	152.809394	-31.285339
N0733-C0004	Telegraph Point	94352N	56	GDA94	152.792261	-31.269748
N0741-C0018	Bobin	93341S	56	GDA94	152.427875153 change to 152.426391	.-31.7341484732 change to -31.735765
N0748-C0012	Bellbrook	94363N	56	GDA94	152.739616	-30.852749
N0748-C0013	Willawarrin	94363S	56	GDA94	152.738494	-30.880719
N0748-C0018	Clybucca	94362S	56	GDA94	152.797109	-30.877242
N0748-C0021	Bellbrook	94363N	56	GDA94	152.739642706 change to 152.741218	.-30.8428231226 change to -30.844387
N0748-C0025	Willawarrin	94363S	56	GDA94	152.725534174 change to 152.725675	.-30.8835705894 change to -30.884228
N0748-C0031	Bellbrook	94363N	56	GDA94	152.736463	-30.847945
N0748-C0034	Bellbrook	94363N	56	GDA94	152.722246	-30.833962
N0752-C0029	Willawarrin	94363S	56	GDA94	152.721423089 change to 152.723269	.-30.9952787799 change to -30.998377
N1047-406-3	PALLAMALLAWA	8939S	56			
N1047-406-4	PALLAMALLAWA	8939S	56			
N1047-406-5	PALLAMALLAWA	8939S	56			

Specified Access	Park Name	Nearest town with NPWS office	Contact Number
Marara road	Chaelundi National Park	Dorrigo	(02) 6657 2309
Peacock Creek Road	Richmond Range National Park	Kyogle	(02) 6632 0000
Simons Road	Kumbatine National Park	Arakoon	(02) 6566 6621
Jones Road	Kumbatine National Park	Arakoon	(02) 6566 6621
Warra Trail to Kings Mountain Trail (private property and park) cleared site just off Kings Mountain Trail near Warra Trail	Ghin-Doo-Ee National Park	Pacific Palms	(02) 6591 0300
North Block off Myall Creek Road.	Bungawalbin National Park	Alstonville	(02) 6627 0200
Newmans Flat area west of Myall Creek Rd.	Bungawalbin National Park	Alstonville	(02) 6627 0200
Palmvale Spur Rd Mooball NP	Mooball National Park	Kyogle	(02) 6632 0000
Silky Road via Tainish Road, Old log dump on E side of Road	Mount Pikapene National Park	Grafton	(02) 6641 1500
South Yabbra Forest Road then Yabra Plains road	Yabbra National Park	Kyogle	(02) 6632 0000
North Wollumbin Road, Caldera Road	Wollumbin National Park	Kyogle	(02) 6632 0000
Bundjalung Crown Reserve. Adjacent to Lockleys Road (on western side) approx. 1.25km south of west of crossroads of Range, Jackybulbin and Dehoons Roads.	Bundjalung State Conservation Area	Alstonville	(02) 6627 0220
Basin Road	Jaaningga Nature Reserve	Coffs Harbour	(02) 6652 0900
77.3 Trail	Cooperabung Creek Nature Reserve	Arakoon	(02) 6566 6621
Red Hill Road	Cooperabung Creek Nature Reserve	Arakoon	(02) 6566 6621
Ironbark Trail or Taylors Road to be determined	Goonook Nature Reserve	Port Macquarie	(02) 6588 5555
Cnr Green Hills Rd/ Spoon Trl	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Green Hills Rd/Taylors Arm Rd	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Stockyard Ck Rd then Cauhouns Rd	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Mcleods Trail	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Trig Rd/Johnson Rd or old Bridge Trail to be determined	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Green Hills Rd	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Greenhills road then Mungay Mountain Trail	Ngambaa Nature Reserve	Coffs Harbour	(02) 6652 0900
Jocks Crossing Road then unnanmed_NM1633	Skillion Nature Reserve	Coffs Harbour	(02) 6652 0900
Set Down Site To Be Determined - Gil Gil Creek Road	Bullala CCA Zone 1 National Park	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Rocky Hole Road	Bullala CCA Zone 1 National Park	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Rocky Hole Road	Bullala CCA Zone 1 National Park	Narrabri	(02) 6792 7300

BeeSite Identifier	Topographic Map Name	Topographic Map Number	Map Zone	Datum GDA94	Longitude GDA94	Latitude GDA94
N1055-436-139	MOGRIGUY	8633N	55			
N1055-436-165	MOGRIGUY	8633N	55			
N1055-436-189	MOGRIGUY	8633N	55			
N1055-84	BALLADORAN	8634S	55			
N1055-85	BALLADORAN	8634S	55			
N1066-515-A	WINTON	90354N	56			
N1067-274-1547	BUGALDIE	8735N	55			
N1067-274-1548	BUGALDIE	8735N	55			
N1067-274-1549	BUGALDIE	8735N	55	GDA94	149.21464984200	-31.00849992010
N1067-274-1557	BUGALDIE	8735N	55	GDA94	149.21764596500	-31.02978973140
N1067-819-1381	BARADINE	8736S	55			
N1067-844-1380	BARADINE	8736S	55			
N1067-844-1399	BARADINE	8736S	55			
N1068-915-1	TAMBAR SPRINGS	8835S	55	GDA94	149.678007	-31.333823
N1068-915-2	TAMBAR SPRINGS	8835S	55	GDA94	149.689279	-31.335143
N1068-915-3	TAMBAR SPRINGS	8835S	55	GDA94	149.703597	-31.335143
N1071-1	GOOLMA	8733S	55			
N1076-150-42	TERRY HIE HIE	8938S	56			
N1076-150-48	GRATTAI	89374N	56			
N1076-414-33	TERRY HIE HIE	8938S	56			
N1076-421-13	TERRY HIE HIE	8938S	56			
N1076-421-16	TERRY HIE HIE	8938S	56			
N1076-421-17	TERRY HIE HIE	8938S	56			
N1076-421-6	GRAVESEND	8938N	56			
N1076-710-22	TERRY HIE HIE	8938S	56			
N1082-12	DURRIDGERE	88331S	55	WGS 84	149.813584	-32.125896
N1082-13	DURRIDGERE	88331S	55	WGS 84	149.777568	-32.122733

Specified Access	Park Name	Nearest town with NPWS office	Contact Number
Set Down Site To Be Determined - Western boundary Trail	Goonoo CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Western boundary Trail	Goonoo CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Green Management Trail	Goonoo CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined	Goonoo CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined	Goonoo CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - North West Trail	Somerton CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Swan Rd	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
Set Down Site To Be Determined - Falcon Road	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
Rogers road	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
Rogers road	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
Set Down Site To Be Determined - Ruins Road OR Gibbican Road	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
Set Down Site To Be Determined - Ruins Road	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
Set Down Site To Be Determined - Orr Road	Timallallie CCA Zone 1 National Park	Baradine	(02) 6843 4001
North-West Fire Trail	Tinkrameanah CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
North-West Fire Trail	Tinkrameanah CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Eastern Trail	Tinkrameanah CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Upper Mebul Rd	Yarrobil CCA Zone 1 National Park	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Berrygill Trail OR Gulf Trail	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Berrygill Road	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Cottage Road	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Bad Lands Road	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Terry hie hie Trail	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Mallee Road	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - Bad Lands Road	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Set Down Site To Be Determined - SR191 OR Irrigappa Road	Terry Hie Hie CCA Zone 2 Aboriginal Area	Narrabri	(02) 6792 7300
Quarry at the intersection of Cliffdale Road and Ulan/Cassilis Road	Durridgere CCA Zone 3 State Conservation Area	Mudgee	(02) 6370 9001
Adjacent to dam alongside Cliffdale Road	Durridgere CCA Zone 3 State Conservation Area	Mudgee	(02) 6370 9001

BeeSite Identifier	Topographic Map Name	Topographic Map Number	Map Zone	Datum GDA94	Longitude GDA94	Latitude GDA94
N1082-5	CASSILIS	88331N	55	WGS 84	149.906749	-32.126116
N1084-436-100	MENDOORAN	8734S	55			
N1084-436-12	BALLADORAN	8634S	55			
N1084-436-129	MOGRIGUY	8633N	55			
N1084-436-134	MOGRIGUY	8633N	55			
N1084-436-147	MOGRIGUY	8633N	55	GDA94	148.895692	-32.031563
N1084-436-15	BALLADORAN	8634S	55			
N1084-436-33	BALLADORAN	8634S	55			
N1084-436-34	BALLADORAN	8634S	55			
N1084-436-36	BALLADORAN	8634S	55			
N1084-436-37	BALLADORAN	8634S	55			
N1084-436-44	MENDOORAN	8734S	55	GDA94	149.015718	-31.929666
N1084-436-54	MENDOORAN	8734S	55			
N1084-436-75	MENDOORAN	8734S	55			
N1084-436-80	BALLADORAN	8634S	55			
N1092-177-30	TAMBAR SPRINGS	8835S	55	GDA94	149.951075	-31.351222
N1092-177-7	TAMBAR SPRINGS	8835S	55	GDA94	149.980262	-31.358816
N1092-177-9	TAMBAR SPRINGS	8835S	55	GDA94	149.990711	-31.361611
N1095-266-630	CUBBO	8736N	55	GDA94	149.289332	-30.535574
N1095-266-666	CUBBO	8736N	55	GDA94	149.308897	-30.545936
N1135-254-1	JEMALONG	8431S	55			
rb/bnp/01	Cobargo	88252S	55	GDA94	149.909417	-36.460585
rb/bnp/02	Cobargo	88252S	55	GDA94	149.981826	-36.430358
Sef/yur/pump stn	Wolumla	88242N	55	GDA94	149.841645	-36.862648
SRR-S0002	Bendick Murrell	8529-N	55	GDA94	148.421868	-34.072398

Specified Access	Park Name	Nearest town with NPWS office	Contact Number
Quarry alongside Summerhill Road	Durridgere CCA Zone 3 State Conservation Area	Mudgee	(02) 6842 0206
Set Down Site To Be Determined - Hill Management Trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Hendersons Management Trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Mendooran Rd	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Frost Management Trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
off Mendooran Rd (samuels Management Trail is DORMANT)	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Kartzhoff Management Trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Breelong Management Trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Western boundary Management Trail OR Breelong Management Trail OR Hendersons Management Trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Starrs Management Trail is DORMANT	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Kartzhoff Management trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Mendooran Rd	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Mendooran Rd OR Denmire Management	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Starkeys Management Trail OR Mount Carl Management trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Set Down Site To Be Determined - Starkeys Management Trail OR Mount Carl Management trail	Goonoo CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Western Boundary Trail	Trinkey CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
junction of Jungle Road & Trinkey Rocks Trail	Trinkey CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Trinkey Rocks Trail	Trinkey CCA Zone 3 State Conservation Area	Coonabarabran	(02) 6842 0206
Rocky Creek Mill road	Pilliga CCA Zone 3 State Conservation Area	Baradine	(02) 6843 4001
Right Angle Road	Pilliga CCA Zone 3 State Conservation Area	Baradine	(02) 6843 4001
Set Down Site To Be Determined	Lachlan Valley National Park	Bathurst	(02) 6332 7640
Bandicoot Road	Biamanga National Park	Narooma	(02) 4476 0800
Westrops Road	Biamanga National Park	Narooma	(02) 4476 0800
Pump Station Rd off Milligandi Rd	South East Forest National Park	Narooma	(02) 4476 0800
Annandale Trail	Bendick Murrell National Park	Tumut	(02) 6947 7000

NICK'S NEWS from DPI NSW

Nick Annand, Development Officer - Bees
NSW Department of Primary Industries, Bathurst
Phone: 02 6332 8034
Email: nicholas.annand@dpi.nsw.gov.au

VARROA MITE INCURSION EXERCISE

Attwood, Victoria

On 12-13 December 2015 the Victorians conducted a mock Varroa incursion response. The aim of the exercise was to evaluate their capability to conduct a response to an actual incursion. This exercise was organized predominantly by Daniel Martin, Apiary Officer and Joe Riordan, Senior Apiary Officer both of Agriculture Services & Biosecurity Operations, Regulation and Compliance, of the Department of Economic Development, Jobs, Transport and Resources (DEDJTR). Yes a very big mouthful, also involved where about a dozen Animal Health Officers from DEDJTR. The Animal Health Officers came from across the state and took on the roles as team leaders. Each team leader was assigned 2 or 3 beekeepers who have been trained in emergency response monitoring techniques for bees and are known as the SQRT team (State Quarantine Response Team). Many teams also had an additional "observer" go along with them. They included Stephen Green - Regulatory Officer, Grafton and myself from NSW, Michael Steadman – PIRSA, Karla Williams – TAS DPI, Melanie Botrill – Plant Health Aust. and Catherine Phillips – University of Western Sydney. Ten teams in all were made up and assigned hives to go and monitor across Melbourne, Yarra Valley and Geelong. Other lead roles were Incident Controller/Operations Officer, Logistics, Planning/Data Entry, Safety, Mapping, Technical Expert, Industry Liaison, Public Information and Evaluation Officer.

The scenario presented was that suspected varroa had been detected in sentinel hives through the routine surveillance at the ports of Melbourne and Geelong. The extent of the incursion was unknown so surveillance was to be done to establish the spread and possible source of the incursion. Hives were examined for varroa across Melbourne area, Yarra Valley and around Geelong. 30 apiary sites in total were to be visited.

Getting briefed in the Incident Control Centre at the start of day one of the exercise

We started the Saturday with a briefing in the purpose built Incident Control Centre (ICC) in Attwood. What was to happen during the day was explained, key individuals were introduced and we were broken up into teams to head out for the day to complete the surveillance tasks. Any equipment/resources required were packed up ready for collection and taken to the vehicles ready for the day.

Equipment ready for teams to pick up prior to heading out for the day

For Saturday my group had two apiaries to examine down towards Geelong. The first was an apiary of approximately 18 hives. We had some difficulty finding the hives but soon located them and started to set up to complete the surveillance tasks.

Checking hives for brood prior to inserting the dummy miticide strips and sticky mats

The only surveillance technique assigned to our group was to put in dummy miticide strips in the hive with sticky mats on the bottom boards with wire mesh over the sticky mats. We only had enough equipment to do this for 12 hives at this location. These were put into the hives to be collected the following day. After this apiary site we went to another nearby town to inspect a backyard apiary of 2 hives. Again we did the same procedure as at the first. After completion for the day we returned to the ICC. As each team returned they were taken into a room to discuss any issues that arose during the day and encouraged to make any suggestions on how things could be done better.

On Sunday we again started with a briefing at the ICC where all observers were assigned to different teams. This day I visited three different backyard apiaries to the north and north east of Melbourne and collected the strips and sticky mats from the hives.

At the briefing they talked of also using some other surveillance techniques including sugar shaking bees and drone brood examination but neither of these other techniques where used for any of the apiaries I went to. I thought this was a shame as it was a good opportunity to actually do some real surveillance

work which could have been added to the PHA surveillance data for bees. I understand a few of the other groups used the alternate surveillance techniques but none of the teams with observers with them did this. This would have provided a good spread of surveillance across the region.

One WH&S incident occurred during the exercise with a volunteer SQRT team member cutting the tip of his finger off with the new sharp hive tool provided. He was scraping the top of his finger with the hive tool to remove a bee sting and took a bit more than expected not noticing what he had done until he saw the blood.

To test the processes in place a few different scenarios were incorporated to see how teams would respond. One such scenario was the beekeeper could not speak English and how was the team going to get access to the hives. The bilingual beekeeper played along as though he had no English skills. This raised the issue that the team had no way to communicate with him. From this, suggestions that the iPad should have explanations available in many languages on what was happening and the need for access to their bees could be explained. These sorts of odd scenarios where a good idea in the exercise and could have been used a bit more to address some of the issues that will arise in the real situation.

The whole process the SQRT team and the team leader had been trained to perform for surveillance work on bees was of a very high level. The mite was being treated as though it was a contagious microbe with disposable overalls, veils, hats, gloves etc all being double bagged and left on site and everything else including smoker hive tools, boots etc being scrubbed down with Hibitane - water solution. This is good in that the SQRT team if needed for other disease control/surveillance programs would be able to be used for such situations, but obviously that would depend on whether they would want to assist. I saw this whole decontamination process as a little excessive for monitoring for varroa mite. This I believe created inefficiencies and increased expenditure. The transfer of bees is the major threat in relation to transferring varroa so rigorous checking that no bees get relocated via hitching in vehicles or on person is the main decontamination requirement. Jacket/veils should be reused but shaken out before leaving each site to ensure no hitchhikers move between sites. Equipment such as smokers, gloves and hives tools should be cleaned and rinsed if necessary with water to remove honey etc. to prevent the spread of AFB.

Reporting back to the ICC was efficient and easy with all team leaders having iPads and a data entry program which they used on site to immediately upload all information gathered. I understand the program was BIOWEB that was fairly easy to use. To trace samples back to locations and hives Max iPad data capture was used in conjunction with sticky labels with bar codes applied to hives and sticky mates. This allowed for quick efficient upload of data instantaneously.

Some of the team leaders where a bit reluctant with getting to close to the bees but this was not really an issue as the trained beekeepers from the SQRT team could do all the handling of the hives.

The Victorians I would suggest are way ahead of all other States in relation to being prepared to mount an immediate surveillance response for an exotic bee mite incursion. They have 134 beekeepers trained up in there SQRT team. They have large quantities of equipment including 2000 veils and hats, hive tools, smokers, fire hose, fire fighting back packs, buckets, tubs, disposable overalls, gloves etc ready to go.

The NSW situation is quite a way behind, but having said this I believe that we should not follow what and how the Victorians have accomplished this level of preparedness. Yes we do need to get beekeepers trained in relation to how emergency responses to exotic disease incursions are managed in NSW/Australia. Training packages for the background knowledge on how emergency responses are run I understand is in the process of been put online. In relation to surveillance work on beehives our section has been showing beekeepers different surveillance techniques for varroa and other mites for many years. Particularly in our Pests and Diseases of Honey Bees courses where we did a variety of monitoring techniques including, drone examination, sugar shaking bees and miticide/sticky mat monitoring. Having had many beekeepers across NSW attend this course we should be able to call on and refresh these individual's skills very quickly in the case of an incursion. We could also draw on Victorians if needed. If there is an area where we could do some preparedness work it is with the new wave of hobbyist beekeepers around the major cities and the regulatory staff (this could include LLS rangers) to make sure they are trained up. IPads or phones should be used for data entry and training in the use of the relevant data entry program should occur annually for regulatory staff/LLS rangers so they are ready for any exotic incursion response.

The Victorians (particularly Daniel and Joe) organized and conducted a very successful exercise which went off very smoothly. The majority of things were thought of with only very minor tweets required. Thank you for asking observers to attend as I am sure as with myself all other States attending will have learnt a lot from this exercise that will assist them in their own preparation.

THE FROST REPORT

Elizabeth Frost
Honey Bee Education Officer
Tocal Agricultural College, NSW Dept. of Primary Industries
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HISTORY OF A RECENT IMPORT

In January 2016 I flew from San Francisco to Sydney with an Employer-Nominated Permanent Migration Visa in hand. In the 10 months prior to visa granting I had to supply my criminal record from the Australian Federal Police and Federal Bureau of Investigation (FBI), record of employers since birth, record of past 10 years of residential addresses, birth certificate, academic transcript, and, much like queen bees to be imported, I had to prove myself free of diseases. I owe a huge thanks to my employers at Tocal College NSW DPI for persevering through the process and to Doug Somerville, the NSWAA and previous US supervisors Lynn Kimsey at University of California, Davis and Karen Rennich of University of Maryland for their letters of recommendation.

Throughout the visa granting process, I kept myself busy with contract work in a variety of locations. Here's a rundown of my time away from Australia:

Contract work locations in 2015: Vietnam, Washington state, California, Lebanon, and North Dakota.

VIETNAM

Just outside Hanoi, I provided technical instruction for three, 3-day queen bee artificial insemination training courses at Vietnam National University of Agriculture (VNUA) to beekeepers from Điện Biên and Sơn La Provinces and technicians from the VNUA Research Centre for Tropical Bees and Beekeeping. During each training session I gave presentations on bee breeding programs, stock evaluation methods, queen and drone rearing as well as practical training. This was my first time seeing the Asian honey bee *Apis cerana* and the *Tropilaelaps* mite. Working with a translator was a fun challenge.

WASHINGTON STATE

On Whidbey Island off the coast of Washington I provided semen collection and queen insemination services for Susan Cobey, owner of Honey Bee Insemination Services. I collected 500 microliters of bee semen over four days, 300 microliters of which went to annual insemination work Ms Cobey undertakes for the breeding program at Kona Queens, a queen breeder in Hawaii.

Massive propolis collection at the entrance of one of Cobey's colonies, genetics from semen imports of Caucasian subspecies crossed to US domestic stock.

I also worked part-time for Washington State University collecting drones and managing queen rearing tasks such as: cell builder management, grafting, queen catching, nucleus colony management, inseminated queen introduction, and other springtime colony management tasks.

CALIFORNIA

In my home state I contracted artificial insemination services and produced untested AI queens to California queen breeders Can Am Apiaries, Heitkam's Honey Bees, Koehnen & Sons, and Strachan Apiaries in the Sacramento Valley using their own stock. I also provided single drone semen collection services to the USDA for a test of live and dead sperm counting methods.

Single drone semen collection for the USDA on the back of a bee truck at a mating apiary. There's a first time for everything!

LEBANON

For three weeks I consulted in Lebanon for Development Alternatives Inc. on the Lebanon Industry Value Development Honey Chain, a US Agency for International Development (USAID) funded program. I travelled to 5 governorates, interviewing queen breeders and beekeepers, and visiting bee clubs and production apiaries. I trained one queen breeder in artificial insemination of queen bees, assessed current queen production methods, and gave presentations on queen bee breeding in 2 governorates. I ended my consultancy with a report on the Lebanese Beekeeping Industry and recommendations for the operation of a queen breeding centre. I hope to coordinate the importation of artificially inseminated queens of Varroa sensitive hygiene (VSH) stock, derived from the USDA and produced by VP Queen Bees, from the US to Lebanon in 2016.

Production colonies in a summer thistle honey location in Rashaya El Wadi, Lebanon. In the centre is queen breeder Souheil Kadamani with another beekeeper and myself at right.

NORTH DAKOTA

Back in the states I migrated to the Midwest for a month to pull and extract sweet clover, buckwheat and tallow tree honey for the Kletts, queen breeders who migrate from Texas for queen season to North Dakota for honey season.

Colonies stacked high with a sweet clover crop in North Dakota.

Also in North Dakota, I worked on a migratory technician team for the Bee Informed Partnership (beeinformed.org) providing hive assessments and pest, disease and virus sampling to migratory honey producers and queen breeders in their summer locations throughout the state of North Dakota. Hive assessments include estimates of population, brood pattern and visual observation of pest and disease status.

PATERSON, NSW

Now having returned to New South Wales and regained fulltime employment at Tocal College I'm right back into coordinating the Certificate III in Beekeeping, developing coursework and delivering face to face and online training as a Honey Bee Education Officer. I'm also excited to act as AHBIC's Education Committee Chair. Please note my updated contact details above and let me know how I can be of service.

WHAT'S NEXT?

On offer now for NSW New England region beekeepers are partial qualifications in Certificate III in Beekeeping. Vacancies remain and registration closes in March, so contact me today if you've got an address in the New England region and are interested in fully-funded beekeeper training. Tocal College will offer the following units, funded by State Training Services:

- **Use a bee smoker**
- **Open and reassemble a beehive**
- **Manage pests and disease within a honey bee colony**
- **Identify and report unusual disease or plant pest signs**
- **Collect samples for a rural production or horticulture monitoring program**
- Rear queen bees

Units in **bold font** are all part of the Online Pests & Diseases of Honey Bees Course: www.dpi.nsw.gov.au/agriculture/profarm/courses/bees-pests-and-diseases-of-honey-bees-online. We can use Recognition of Prior Learning to prove competency in any of the remaining units on an individual basis.

Additional information on the full Certificate III in Beekeeping, on offer through Tocal College, a Registered Training Organization, can be found here: www.tocal.nsw.edu.au/courses/beekeeping-traineeship.

Student fees for the Cert III in Beekeeping are as follows:

1. $1000 for NSW Smart and Skilled supported Traineeship
2. $1390 for NSW Smart and Skilled supported first qualification (non-traineeship)
3. $1670 for NSW Smart and Skilled supported second for further qualification
4. $3750 full commercial fee for all students not eligible for NSW Smart and Skilled support

If you'd like to see subsidised beekeeper training offered in your region, contact me with your request and I'll see what state funding can be applied for. Cheers to continuing education in 2016, myself included. Time to hit the Eucalypt identification books!

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HEALYGROUP

HONEY MONTH 2016

AHBIC have asked everyone to put on an event for May 2016 showcasing honey and the beekeeping industry. That means your Association branch and also the amateurs branches.

This is a federal initiative and we want your help to put on an event at local level - once a year, and contact our local radio and newspapers to let your local population know that you exist and are interesting in expanding the knowledge of the public. The theme for this year is **clean green, pristine**!

I am working with journalist and food writer Barbara Sweeney to produce some positive interest for journalists with easy contacts for them to pick up and develop stories. Barbara is also a honey judge at the Easter Show in Sydney and has had a long association with the honey industry.

Suggestions - Talks on the following :

- Australian Honey Industry
- Medicinal use of honey
- Pollination- the importance of honey bees
- How do bees live?
- How does a professional beekeeper work?
- Why I became a beekeeper?
- Source of honeys in Australia – eucalypts, gum,
- Or anything that you are comfortable doing

Possible venues:

- Local Library
  - ❖ Arrange a talk in a local library: they are great at advertising for you and will help with any equipment you might want to use.
- Shopping Malls:
  - ❖ A stand with information and handouts on any of the subjects above and leaflets about your organisation, be aware leaflets, posters on pollinations etc.
  - ❖ A display frame with bees on it perhaps.
  - ❖ Sell your honey if you want to.
  - ❖ Be patient with the public, you are the public relations face of an industry which is extremely important in our food chain but under recognised by
  - ❖ Any community events that are on in your area – local councils usually know.
  - ❖ Any event to do with food, farmers markets.

One very successful event is to have an hourly roster of short talks say 10 minutes each , starting at 10am, 11 am, 12 midday, on maybe 4 of the subjects above. With a display of inform tion at the side. Again it's what people are comfortable at presenting. And something that suits your branch.

I am happy to hear from anyone needing posters, leaflets, or any help or information whatsoever to help you to make this happen at a local level. Please feel free to contact me if you would like any resources for this event and I will be happy to help.

Dr Lamorna Osborne - AHBIC Honey Week Chair
Tel: 02 9521 1790 (daytime) or Mob: 0419731684
Email: education@beekeeperssutherland.org.au

NEW ZEALAND NATIONAL CONFERENCE 2016

The Apiculture New Zealand National Conference 2016 will be held in the city of Rotorua on the 19 - 21 June 2016. The conference theme is: ***BEE BUSINESS* – Science: Health: Trade**

The Apiculture New Zealand National Conference 2016 will be the largest gathering of the beekeeping community in the Southern Hemisphere outside of Apimondia.

The conference website is:
http://apicultureconference2016.co.nz/

APIARY COMPLIANCE OPERATION

In late October a group of Biosecurity Regulatory Inspectors travelled to the Broken Hill district to conduct an apiary compliance operation.

Regulatory Specialist Apiaries (RSA), Mick Rankmore, from Gunnedah accompanied apiary officers Dean Whitehead from Hay & Daryl Cooper as we conducted training and organised the compliance inspections of local apiarist's hives.

Alicia Mellberg & David Sinclair, newly appointed Biosecurity Regulatory Inspectors from the Dareton & Griffith DPI research stations, joined the operation to complete their theory requirements and were assessed on practical apiary inspection techniques in the field.

The operation consisted of the inspection of seven different registered apiarist's hives at 11 different sites within the district. A total of 37 hives were extensively examined for the notifiable brood disease, American Foul Brood (AFB).

The Broken Hill district had been devastated by AFB 15 -17 years earlier and commercial & domestic hives were totally destroyed to contain the disease.

Thee commercial apiarists are now managing substantial numbers of hives in the district (this can mean that the hives are located in excess of 500kms from Broken Hill), and local residents are building up their apiaries again. The apiarists in Broken Hill were very keen to co-operate when we sought their permission to inspect their hives. They made every attempt to assist us by giving us verbal consent to enter their property if they were not available to attend in person.

Compliance in relation to registration, identification of brood boxes & disease notification was of a very high standard. In addition the general condition of the hive material was very good as most of the material was new. This significantly reduces the risk of contamination from AFB. Used hive material can be a source of infection.

One neglected hive was inspected and found to have AFB which was subsequently depopulated and burnt with the co-operation of a commercial apiarist. This owner has since been sent the positive analytical results, a warning letter and advisory material.

The apiarists in the area have a genuine interest in the regulatory issues associated with beekeeping and seem to be proactive in the principle that "biosecurity is a shared responsibility".

The new Biosecurity Regulatory Inspectors had a good variety of hives to inspect and were deemed competent as becoming authorised apiary inspectors. Their appointments will be a great asset to the Department and the apiary industry of South West NSW in future apiary work.

Mick Rankmore, Regulatory Specialist Apiaries
Biosecurity Compliance, Department of Primary Industries
T: 02 6741 8374 M: 0402 078 963
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ANNUAL CONFERENCE - 2016 PROGRAM

Commercial Club, Albury NSW

WEDNESDAY 11 MAY 2016 - Wattle Room, Commercial Club Albury	
5.00 - 6.00pm	**MEMBERS HAVE YOUR SAY - Q & A** NSW Apiarists' Association Members are invited to come along and talk to your Executive Council about any ideas, concerns and provide feedback. So please come along and participate.

THURSDAY 12 MAY 2016 - Waratah Room, Commercial Club Albury	
8.00am	**REGISTRATION**
9.00am	NSW Apiarists' Association AGM **Neil Bingley,** *President* NSW Apiarists' Association
9.30am	AHBIC Report - Activities for the year **Ian Zadow,** *Chairman* Australian Honey Bee Industry Council
10.00am	Victorian Public Land Management **Ian Cane**, *Victorian Beekeeper*
10.30am	Official Opening
10.45am	**MORNING TEA**
11.15am	What is the Bee Biosecurity Officer role all about? **TBA,** *NSW Bee Biosecurity Officer* NSW Department of Primary Industries
11.45am	Addressing a shortage of bees for the 2016 almond crop **Ben Brown**, *Project and Technical Manager* Select Harvests - Almond Division
12.15pm	Nominations for Executive Council
12.30pm	**LUNCH**
2.00pm	Dissecting bees without touching them **Dr Mark Greco,** *Senior Lecturer in Medical Imaging* Faculty of Science Charles Sturt University
2.40pm	Nosema disease: a common but cryptic killer **John Roberts,** *Postdoctoral Fellow* CSIRO Biosecurity Flagship
3.10pm	Changes to biosecurity legislation in NSW **Dr Bernie Dominiak**, *Leader Regional Pest Management, Biosecurity, Plant Biosecurity,* Industry & Investment NSW
3.40pm	Native bees **Danielle Lloyd-Prichard,** *Education Officer Professional Development, Education Delivery* Tocal College, NSW Department of Primary Industries
4.10pm	Bioactivity of Australian leptospermum honey - project update **Dr Nural Cokcetin**, Project Co-ordinator
4.40pm	General Business
5.30pm	**WINE & CHEESE NIGHT IN THE TRADE SHOW - sponsored by Capilano**

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ANNUAL CONFERENCE - 2016 PROGRAM

Commercial Club, Albury NSW

FRIDAY 13 MAY 2016 - Waratah Room, Commercial Club Albury	
8.30am	**REGISTRATION**
9.00am	Honeybee nutrition **Dr Doug Somerville**, *Technical Specialist Honey Bees* NSW Department of Primary Industries
9.30am	BeeAware, surveillance program, online training module and other honey bee projects **Alison Saunders,** *National Manager, Horticultural Cropping* Plant Health Australia
10.00am	Social barriers to achieving **Pip Job,** *Project Manager Resilience, 2014 National & NSW/ACT RIRDC Rural Woman of the Year* NSW Department of Primary Industries
	Close of nominations for Executive Council
10.30am	**MORNING TEA**
11.15am	NSW Department of Primary Industries Reports **Dr Doug Somerville**, Technical Specialist Honey Bees and **Mick Rankmore**, *Regulatory Specialist, Apiaries,* **Elizabeth Frost** Education Officer Honey Bees
12.00pm	The ins and outs of apprenticeships and traineeships **Garry Whittaker,** *Regional Manager Riverina, Skills and Industry Policy Division State Training Services NSW Department of Primary Industries*
	Close of voting for Executive Council
12.30pm	**LUNCH**
2.00pm	Drought relief packages **John Newcombe,** *Director* NSW Rural Assistance Authority
2.30pm	Flying doctors **Dr Katja Hogendoorn**, *School of Agriculture, Food and Wine,* The University of Adelaide
3.00pm	Honey bee and pollination report from the Rural Industries Research and Development Corporation **TBA**, RIRDC Honey Bee and Pollination Advisory Committee
3.30pm	Importation risk assessment of imported bee semen **Elizabeth Frost**, *Education Officer Honey Bees* Tocal Agricultural Centre NSW Department of Primary Industries
4.00pm	General Business
4.30pm	Close
7.00pm	**ANNUAL CONFERENCE DINNER**

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WHAT'S HAPPENING TO THE BEES - PART 2

by Randy Oliver - ScientificBeekeeping.com

Over the past few decades, as a beekeeper/biologist I've had the opportunity to watch evolution in action. I've observed the catastrophic effects upon colony health due to the introduction of new parasites, periodic pathogen epidemics, and the more subtle effects of changing land use practices and climate change. I've also witnessed the evolution of both recreational beekeeping and the bee industry, as we've been forced to change our management practices and income streams due to the aforementioned biological and environmental factors, plus changes in markets and the impacts of regulatory decisions.

My point is that *things change*, each change altering the *realized niche* of both bees and beekeepers. Neither Nature nor the Market are the least bit sentimental. Those who don't adapt to change die.

The adaptive process may make headlines, or it may go largely unnoticed. But one thing's for sure—the more that we understand the changes in the parameters of the bee and beekeeper niches, the better we can successfully engage in the adaptive process.

We Are Two Adaptive Species

Both *Apis mellifera*, and those *Homo sapiens* categorized as "beekeepers" have proven to be incredibly adaptive species (ecologists would say that we exhibit a high degree of *plasticity*). At times, each of our populations face *limiting factors* that weed out the least fit. And the higher the failure rate of individual colonies or beekeeping operations, the stronger the selective pressure to adapt.

So what sort of failure rate is "normal" for bees under optimal natural conditions (the *fundamental niche*)? Let's do the math! Given: an established and *stable* local population of bees under optimal conditions. In the spring each colony will produce at least one swarm. At that point, the colony population will have temporarily at least doubled. But such a rate of reproductive increase is obviously unsustainable, since by definition a "stable" population ends with the same number of colonies each year. So simple arithmetic tells us that in nature, *on average,* at least half of all colonies will succumb each season, even under the best of conditions.

Although half the colonies will fail *on average*, it is not the average colony that fails. The key point is that it is the *least fit* that tend to fail, and a greater proportion of the *most fit* survive. This considerable amount of selective pressure is what drives adaptation and evolution in each natural population of bees.

It's the same with beekeepers. The failure rate for beginning beekeepers is often even higher than the above. Commercial operations also fail; despite record high prices for honey and pollination services, our recent elevated colony mortality rate is eliminating the profit margin for some operators, who, sadly, will go out of business. But, again, the hard fact is that it is the less fit (or less adaptable) operations that are failing—I speak with plenty of operators who aren't experiencing egregiously high winter losses, and whose businesses are firmly in the black. It is these operations that are successfully adapting to their realized niche.

Honey Bees Are Designed For Rapid Adaptation

As I study the honey bee reproductive strategy, one principle jumps out:

Everything about the honey bee reproductive process is designed for rapid adaptation to changes in its realized niche, and for the recovery of the bee population from decimation events [1]**.**

Apis mellifera has the highest known rate of genetic recombination of any animal. And those "experimental" recombinations are then filtered for success through the haploid drones, who have only one set of chromosomes, meaning that only the best novel combinations of genes (alleles) have any chance of being passed to the next generation.

The genetic combinations of the *fittest* drones then predominate in the matings that occur in drone congregation areas, thus ensuring that each virgin queen has the best chance of loading up with the best genetics that the overall bee population in that area has to offer. And she further ensures the maximum diversity of her offspring by mating with multiple drones. Add to this the incredible epigenetic plasticity of the honey bee [2], and we have an organism able to quickly adapt to whatever Nature throws at it!

I observe something similar with beekeepers. Those who are consistently trying new things and adapting to the changing biological and business environments are those who tend to be the most successful in the long run.

The Human-Facilitated Realized Niche of the Bee

OK, so in nature, half the colonies fail each year. But provided facilitation by human beekeepers, that rate can drop to around 10% for well-managed operations. However, in recent years, U.S. beekeepers have been reporting distressingly high rates of colony failure. Clearly, something in the realized niche of our honey bees has changed in the last decade (one or more *limiting factors*). In order to attempt to figure out exactly which factors are responsible, let's first determine what the primary limiting factors were for honey bee populations *prior* to humans. Perhaps then we can better understand how our actions (and the Earth's burgeoning human population) are affecting honey bee survival. And maybe then we can take steps to make life easier for our beloved bees (and improve the bottom line of those of us who make our living at keeping 'em).

The Natural Limiting Factors of the Honey Bee Population

Limiting factor: The weather

The weather would be an obvious limiting factor—colonies are stressed by extreme cold, unfavorable flight weather during the spring or summer, or by lack of forage and water during droughts.

Such intermittent weather events may sporadically cull the bee population, but would only affect long-term adaptation if they occurred regularly. So let's focus upon which factors limited bee populations in *favorable* years, during which they have the intrinsic ability to increase exponentially.

Limiting Factor: Predation

Honey bees are herbivores. The populations of many herbivores are controlled by predators (Fig. 1). If the population of the prey species becomes dense, predator species ramp up their numbers to take advantage of the food source. The result is typically an oscillating predator/prey population dynamic (this is one of the bases for integrated pest management in agriculture).

assassin bugs, birds, spiders, and dragonflies. One of "my" bees (above) became a meal for a robber fly.

Although predators of foraging bees may take a bite out of the population of older bees in the hive, they do not appear to be a primary limiting factor of the overall bee population. An exception to this rule might be the Asian Hornet (*Vespa velutina*) (now introduced in Europe), which can decimate small colonies of bees by picking off returning foragers [3].

A more serious form of predation is direct invasion of the hive. A healthy colony can generally repel or otherwise deal with small invaders such as ants, wasps, and Small Hive Beetles. More problematic are those large mammalian predators willing to ignore the bees' defensive stinging, such as bears, skunks, honey badgers, and humans. The bees' main defense against such predators is to nest in inaccessible fortifications. And that leads us to…

Limiting Factor: Competition for Nest Cavities

Bees are pretty picky about the nest cavities that they choose, strongly preferring elevated tree cavities having small, defendable entrances [4] (Fig. 2). In treeless areas, the lack of suitable nest sites could well have been a limiting factor for the honey bee population. But this is unlikely to have been the primary limiting factor anywhere that patches of ancient forest were within range.

Figure 2. This hollow black oak provides a protected nest cavity impenetrable by our local black bears.

Although a lack of suitable cavities may not the main limiting factor of the bee population, it does bring to mind another fascinating aspect of bee behavior. Please allow me to digress for a bit. Not all beekeepers are aware that intra- and inter-species parasitism is common among bees, wasps, and ants. For example, queens of a number of bumblebee species parasitically invade and take over other bumblebee colonies. And the Cape Bee (*Apis mellifera capensis)* is famous for its ability to parasitically take over colonies of the Savannah Bee (*Apis mellifera scutellata*) [5]. This sort of deplorable behavior appears to be ingrained in the bee genome– bees covet the fruits of their neighbors' hard work.

Part of the Africanized honey bees' ability to rapidly expand its range in the Americas was likely its ability to invade and usurp the established nests of European bees [6]. Lately, Dr. Wyatt Mangum has been reporting on his observations of similar behavior by ostensibly non-Africanized bees in Virginia [7].

Such takeovers give the usurping swarm a profound advantage. Rather than needing to establish a nest and provision it with stores from scratch, it can simply take over an established colony, essentially hijacking its combs, stores, and entire workforce. Although Mangum, so far as I know, is the first to report such behavior for European honey bees, his observation may answer a question that has been bugging me for years: why do European bees send out what appear to be doomed swarms in late summer?

Bees typically swarm in spring, for the obvious reason that that timing allows the swarm colony to establish and provision a nest in time for winter. But in actuality, there are two peaks of swarming during a season (Fig. 3). I'd long noticed this, and wondered why in the heck a colony would bother to swarm in the late summer—natural selection should have eliminated such suicidal behavior. It just didn't make sense!

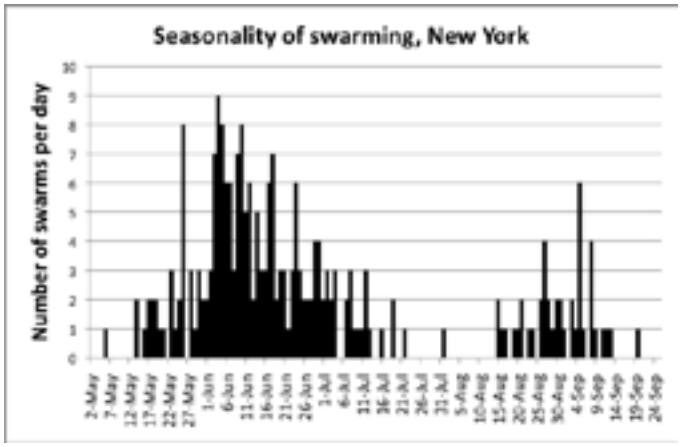

Figure 3. Seasonal timing of swarm emergence dates in New York, showing the main late-spring peak, followed by a lesser peak around the first of September. Why the heck would colonies swarm in late September? After Seeley [8].

But Mangum's observations reminded me that I've also seen in past years late-summer swarms landing on hives, and also seen balled queens in hives in late summer. Perhaps I simply never put it all together! Could it be that this is an innate, but previously unrecognized, behavior in European bees?

It is certainly biologically plausible that under certain circumstances European colonies behave like their Africanized brethren (they *are*, after all, the same species), and send out older queens who have already successfully built up a colony (and perhaps even a second swarm colony), but still have enough vigor left to do an invasive usurpation of a nearby nest. If the colony were already superseding that queen, then it would be an inexpensive gamble to send her out, accompanied by a hit team of experienced workers, to try to take over an unsuspecting colony, its stores, and its workforce shortly before winter.

Pardon my digression—let's return to our search for the main limiting factor of the natural bee population.

Limiting Factor: Carrying Capacity of the Habitat
The maximum population density for the realized niche of a population is set by the *carrying capacity* of that particular environment, typically limited by resources such as food. However, the honey bee is a special case; similar to the bear, the colony can gorge when food is plentiful, and store "fat" (honey and beebread) as reserves for lean times (as during overwintering).

There are indeed areas in which colonies can barely put on enough honey during the main flow in order to make it through the winter. But by definition, such areas would not meet a primary requirement of the fundamental (optimum) niche of the honey bee, so we can disregard such areas from this discussion. What we are interested in is the limiting factor of the bee population in areas that normally produce a good honey flow.

Limiting Factor: The Timing of the Bloom
Honey bees are defined by their ability to store food reserves—honey and beebread—to see them through lean times. But there are times other than the main honey flow during which the availability of nectar, and especially pollen, are of critical importance to the ability of colonies not only to survive, but also to reproduce. Colonies must build up and produce a swarm early enough in the season that both parent and swarm colony have fighting chances to store enough honey to make it through the following winter [9]. Such buildup requires the initiation of brood rearing in the middle of winter, which is in turn dependent upon having stored a large supply of beebread during the fall pollen flow [10].

What we must keep in mind is that a colony of bees is only effective at putting away a honey surplus if it has grown a large enough population to efficiently forage upon and store the available nectar. Timing is everything. Too large a population at the wrong time of the year would be counterproductive, since those hungry mouths would consume more honey than they were able to store. A locally-adapted population of bees times its buildup to coincide with the main flow, and then quickly shrinks back to survival mode.

Many of us tend to base our idea of typical bee behavior upon that of commercially-selected Italian stock. Such stock, originally adapted to Mediterranean climates, and bred for continuous brood rearing and high honey production, can hardly be expected to be representative of *wild type* bees adapted to cold-winter areas (I am not dissing Italian-type bees—they are well adapted to build up early for almond pollination).

Bees adapted to colder winters, such as the Carniolans or Russians, are far more responsive to the environment, especially to the availability of pollen. As soon as plants start producing pollen in spring, bees of these races explode into action — working even in cool and wet weather, and madly brood up.

The reason for their frenzy is that they must build up their population early enough to produce a swarm in time for it to have a decent chance at establishing a nest and putting away adequate winter honey stores during the brief main honeyflow (typically May through June; in temperate climates, colonies may only gain weight for a few weeks a year). I've previously graphed the bee colony's amazing ability to quickly build up [11]. An absolute requisite for such a rapid rate of growth is a monster supply of pollen in the early spring.

After the main flow comes the summer dearth. When pollen is unavailable, wild-type bees sit tight in survival mode [12], cooling their heels and conserving their energy. I've seen Russian bees cease brood rearing in August in the arid California foothills, appearing as though they were queenless. In the adjacent yards, my Italian stock just keep on rearing brood, and required supplemental feeding of protein in order to keep them in decent shape for going into winter..

So I suspect that the limiting factor for bees in a natural realized niche is not the amount of food available during a brief period of food abundance (the main honey flow), but rather the quality & quantity of forage available during spring and late summer/fall.

Practical application: the *realized niche* of the honey bee is likely largely defined *not* by the amount of nectar available during the main honey flow, but rather by the quantity and quality of pollen available *prior to* and *after* that period. A successful colony requires a dependable abundance of quality pollen and nectar for early spring buildup; and then adequate late-season pollen to ensure its ability to produce a cluster of protein-rich "winter bees" and to store beebread for midwinter brood rearing.

Nevertheless, prior to man, biologically productive areas typically supported a diversity of native vegetation that produced exactly such an extended season-long buffet of nutrition. Thus, I doubt that during favorable years, a lack of available spring or fall food resources was the limiting factor of the bee population prior to man.

Limiting Factor: Competition for Those Food Resources
Competition for food resources, either against other species or one's own species, is a common limiting factor of the realized niche. So what sort of competition do bees face?

Anywhere that there are flowering plants, there are pollinators that have coevolved with them. Most are insects (although in some areas, birds, bats, or other mammals may be important). Does competition with other pollinators limit the honey bee population?

Let's think about it. Since one can place a hive of bees into most any favorable habitat and still make honey despite the presence of established populations of native pollinators, I suspect that competition with other species is not normally the limiting factor of the honey bee population. On the other hand, as any beekeeper quickly recognizes, honey bee colonies certainly compete with one another!

Beekeepers tend to focus upon the amount of nectar available during the main honey flow, and understand that one can overload an area with managed hives. But how about the density of a natural population of bees—does the amount of nectar available during the main flow limit that population?

Again, let's check easily-verifiable observations. In areas with well-established populations of feral bees (Australia, Hawaii, formerly in the U.S), one can bring in additional managed colonies, yet still produce a substantial honey crop during the main flow—clearly, nectar is produced in excess of what an established natural population of bees can harvest. It follows then that at a "normal" population density of unmanaged colonies, competition for nectar *during the main flow* was not the limiting factor for colony survival.

On the other hand, competition for pollen during spring or fall could well be a limiting factor. And along with that competition comes…

Limiting Factor: Intercolony Parasitism
Competition between colonies does not occur only for nest sites or at the flower; it can also happen directly at the hive. All's fair in love, war, and in Nature. If you can save yourself effort by stealing the fruits of another's labor, so be it. The term for this is *kleptoparasitism* (kleptoparasite: a bird, insect, or other animal that habitually robs animals of other species of food).

What we call "robbing" is a form of kleptoparasitism, and during early spring or the summer dearth, the robbing pressure between colonies can brutal. There would be a clear competitive advantage to those colonies that successfully robbed honey from others; conversely, there would be an advantage to those colonies best able to defend their hard-won stores.

Robbing behavior may also be more insidious than the overt invasion of a weak colony by a strong colony. Dr. Wyatt Mangum detailed the sneaky "progressive robbing" of one colony by another [13]. Such robbing would constitute an insidious drain upon the victim colony. In areas of high colony population density, I suspect that robbing pressure–at times other than during major honey flows–is a limiting factor in colony density.

And this very robbing behavior brings us to our last suspect factor– that famous Horseman of the Apocalypse, *Pestilence*.

Limiting Factor: Pathogen Transmission

As most beekeepers soon find out, honey bees are host to a number of parasites and pathogens. To a biologist, a pathogen is a parasite (such as a virus, fungus, or bacterium) that can cause disease. These parasites can cause the bees to suffer from either *endemic* or *epidemic* infections. A well-adapted parasite typically does not, under normal circumstances, cause serious disease, but rather smolders in the bee population of each individual colony as an endemic infection; sacbrood virus or *Nosema apis* follow this model. These well-adapted parasites are typically *vertically transmitted*, that is, from parent to offspring, or in the case of bees, from mother colony to daughter colony. They can generally be found in a colony, but so long as the colony is not stressed, there are no symptoms of disease.

Other parasites tend to go epidemic, sometimes in recurring cycles; chalkbrood, Chronic Bee Paralysis Virus, American Foulbrood, and European foulbrood fall into this category. Individual colonies are able to "clear" themselves of these parasites; the parasites maintain a presence in the local bee population, but may not be found in every colony. Epidemic parasites are largely dependent upon horizontal transmission from colony to colony, and unlike the well-adapted endemic parasites, actually benefit by the weakening or death of an infected colony. As such, they would be considered to be *density dependent infectious diseases*. As the density of the host (honey bee colonies) in the environment increases, the opportunities for transmission of the parasite from colony to colony directly increases [14]. The pathogen causing the disease can only persist if the host density exceeds a certain threshold (if bee colonies were scattered beyond flight distance, there would be slim possibility for an infectious pathogen to transmit from one colony to another).

Conversely, not being regularly exposed to a pathogen removes the selective pressure for the bees to maintain genetic (or epigenetic) resistance. Thus, in nature, epidemics of certain pathogens ebb and flow, often decimating a host population one year, at which point the host density is decreased to the extent that the pathogen nearly disappears, struggling to maintain a foothold in the few remaining, and most resistant, hosts. As the host population then recovers over the years, an epidemic may then recur (higher host densities favor virulent mutations of the pathogen). This is a common cyclic pattern in insect species with large populations, and bees are no exception [15].

Practical application: After a plague it may take years for a particular pathogen to again recover its hold in the bee population. And it may take a special combination of environmental circumstances, and perhaps coinfection with other parasites, in order for it to do so.

For most species of wildlife, natural populations tend to reach some sort of dynamic equilibrium, with pestilence being the ultimate limiting factor if all other conditions are optimal. Anderson [16] explains:

It is likely that interplay between the pathogenicity of viral, bacterial, [or] *protozoan infections and the nutritional state of the host contributes importantly to the density-dependent regulation of natural populations, with the parasites greatly amplifying the effects of low levels of nutrition.*

Such pestilence typically occurs in the form of epidemics, during which the pathogen(s) efficiently spread through a stressed and overcrowded population, the key word being *overcrowded*. Too many colonies of bees in an area is a recipe for disaster—a ticking time bomb just waiting for the right combination of environmental circumstances and the presence of a virulent pathogen (or combination thereof).

A Special Case: The Viruses

But it's a bit more complicated when *reservoir hosts* are involved. That is, when a pathogen is not limited to honey bees as its sole host. And this is the case with the "bee" viruses, most or all of which appear to actually be generic insect viruses that bees pick up when they visit flowers. So it is likely that the density of the bee population is not limited merely by diseases specific to honey bees, but also by the entire pool of viruses that infect pollinating insects [17] (Fig. 4).

Breaking news: As I type these words, a collaboration of researchers associated with the USDA ARS labs is about to release a stunning paper [18], in which they detail how a plant virus is now infecting both honey bees and varroa, and appears to be associated with collapsing colonies. Their findings suggest that varroa may be a key player in the cross-kingdom jump of this virus. The complexity of the bee, mite, plant, and virus web of infection continues to astound us!

Figure 4. These Russian bees near the hive entrance are in the process of cooking a too-bold bald-faced hornet to death [19].

Hornets and yellowjackets eat bees, and are thus exposed to bee pathogens. Exposure also goes the other way as the wasps contaminate nectar with virus particles when they visit flowers, or, as in this case, if the dying wasp exudes any body fluids.

Historically (meaning prior to varroa), these viruses were sporadically present in bee colonies, but generally as *inapparent* (free of noticeable symptoms) infections [20]. It was only under certain circumstances that they went epidemic and caused noticeable morbidity or mortality of colonies:

Taken together, these data indicate that bee virus infections occur persistently in bee populations despite the lack of clinical signs, suggesting that colony disease outbreaks might result from environmental factors that lead to activation of viral replication in bees [21].

In any case, in some years in some localities, such "perfect storms" of environmental factors, virulent mutations of one or more pollinator viruses, and coinfections with other parasites have historically led to serious colony collapse events [22]. This is not a new thing!

Conclusion
My original question was what were the primary limiting factors in the realized niches of the honey bee prior to human influence? I hope that I have adequately covered these factors, since I feel that our understanding of them is critical for us to be better beekeepers, and to make good management decisions.

As always, I prefer to let the reader draw his/her own conclusions, but to me it appears that that the primary limiting factors in colony survival in *favorable* areas were most likely the density-dependent competition for pollen during spring and fall, coupled with the associated transmission of certain pathogens.

The above factors have long been associated with epidemics in the bee population. It appears to me that our bees today are in the midst of an ongoing and complex multi-pathogen epidemic largely precipitated by the actions of mankind. In the next installment of this article I will explore how this situation came about, examining how changes in world trade, agriculture, the environment, and in beekeeping practices have affected the realized niche of the bee, its parasites and pathogens, and the business models of beekeepers. My hope is that by fully understanding how we inadvertently helped to create the problem, that perhaps we can better take steps to help our poor bees deal with the problem, and for ourselves to stay in business in the process.

Footnotes and Citations
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These articles were originally published in the American Bee Journal. All of Randy's bee articles be found at: www.Scientificbeekeeping.com. If you find these articles of use. Randy appreciates donations to fund his efforts.

LETTER TO THE EDITIOR

A United Bee Industry

The Western Australian Bee Industry has great pleasure in announcing the formation and incorporation of the Bee Industry Council of Western Australia (BICWA) in December 2015. BICWA is a non-profit company limited by guarantee.

BICWA brings together the four prime bee industry organisations in Western Australia. The purpose of the formation of BICWA is to foster, promote and enhance a sustainable bee industry in Western Australia and to protect the interest of producers and co-dependent industries and organisations. It is also a point of contact for bee industry matters.

These groups and their representatives are:

- WA Farmers Beekeepers Section - Leilani Leyland (Secretary) & Rod Pavy
- Agricultural Produce Commission,

  Beekeepers Producers' Committee - Colin Fleay (Chairman) & Tiffane Bates
- WA Beekeepers Association - Wayne Ridley & Peter Detchon
- WA Apiarists Association - Geoff Defrenne & Gary Templeton

We look forward to a continuing positive relationship with all interested and supportive entities.

Please do not hesitate to contact myself should you have any further queries.

Yours faithfully,
Leilani Leyland, Secretary
10 January 2016
Bee Industry Council of Western Australia
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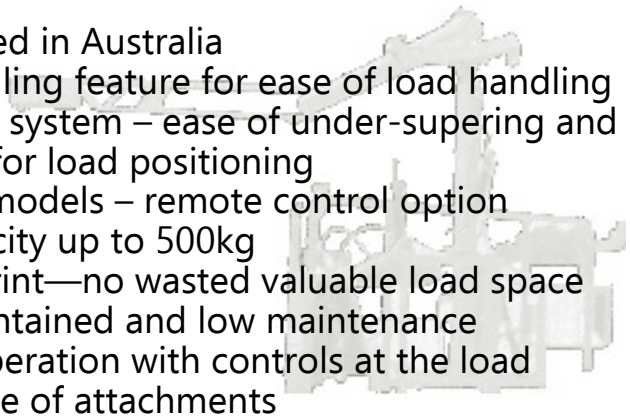

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