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# Establishing a Honey Bee Sanctuary in Niue – Feasibility Study

**AsureQuality Ltd and the Standards and Trade Development Facility (STDF)**

**September 2019 – January 2020**

## EXECUTIVE SUMMARY

The purpose of this report is to investigate the feasibility of establishing a honey bee sanctuary in Niue. The outcomes for the Niue Honey Bee Sanctuary identified in the project proposal are as follows:

- Establishing a source of honey bee stock with favorable disease status from which commercial exports of live bees could be taken.
- Protection of honey bee biodiversity and the genetic purity of the Italian honey bee.
- Developing an alternative and sustainable source of bee imports for the Pacific Islands.
- Augmenting regional agricultural productivity.
- Establishing the foundations for a potential Pacific Research Centre to further research and development into bee health.
- Forming an authentic and compelling communications platform to promote bee health.
- Supporting livelihoods in the Pacific region.
- Contributing to native bush regeneration, thereby mitigating the effects of global warming and soil degradation.

The Niue Honey Company Ltd (henceforth called the Niue Honey Company) is the only beekeeping operation in Niue and currently maintains an estimated 2500 hives in 30 apiaries. The company had approximately 700 hives in April 2013 but these have been extensively split to increase hive numbers. The annual honey crop is currently 15-20 tonnes, most of which is exported to New Zealand for use as an ingredient and potential export to other countries. A small, but growing, quantity of honey is being marketed locally in Niue, especially to tourists.

The current disease status of honey bees on Niue is one of the most favourable in the region and possibly the world. These bees are unencumbered by the Varroa mite (*Varroa destructor)*, present in New Zealand, and the bacterial disease European Foulbrood (*Melissococcus plutonius),* present in Australia. These two diseases are also present in many other countries with significant *Apis mellifera* based beekeeping industries. Additionally, American foulbrood disease (*Paenibacillus larvae)* has not been detected since 2014, suggesting that, in time it may be possible to declare country freedom from this bacterial disease making Niue one of the few beekeeping regions in the world able to make such a declaration.

From a Biosecurity perspective, the establishment and maintenance of a honey bee sanctuary on Niue Island is possible. This is evidenced by the fact that bees have been managed on the island by the Niue Honey Company since the late 1990's with no change in disease status. In addition, it is possible that American Foulbrood (AFB) disease has been eliminated.

There are opportunities to strengthen the biosecurity system and challenges associated predominantly with a growing tourist industry. It is recommended that these are considered in the interests of protecting the bee stock into the future.

The Government of Niue, and the Niue Honey Company, are currently in discussions regarding the government purchasing a shareholding in the company. This strengthens the justification for investment in the bee sanctuary concept as the people of Niue have a stake in its financial success.

There was widespread support for the Sanctuary communicated via the community consultation meeting. This meeting involved both landowners, Niue Honey company representatives, and representative from various government departments.

The Niue Department of Agriculture, Forestry, and Fisheries (DAFF) is very supportive of the Niue Honey Bee Sanctuary concept, as confirmed by their letter of support progressing this PPG. They have a very good working relationship with the Niue Honey Company, working closely with them around the export of honey to New Zealand, and the import of new beekeeping equipment (woodware) for the purposes of maintenance and expansion of managed bee stocks on Niue.

The Biosecurity system at the border is providing good protection though it is clear that there is little spare capacity in the system. This is a situation that will need addressing if an equal level of border protection is to be provided at the target tourist volume of 15,000 per annum. Additionally, it is understood that there are ongoing investigations around the possibility of an air service from Tonga. This risk pathway would require effective management of risk as Tonga's apiculture industry suffered the introduction of the Varroa bee mite in approximately 2006.

It is unlikely that the Bee Sanctuary can support itself predominantly via the sale of honey bee stock either into the Pacific or further afield in the short to medium term.

Key issues include:

- The lack of a Chief Veterinary Officer, as this is likely to be a requirement for the signing of Official Assurances for many potential trading partners. Additionally, the negotiation of export protocols without technical support would also be challenging. For New Zealand, this is more about the Competent Authority (DAFF) having robust systems in place to support the signing of official assurances.
- Limited transport options. Commercial flights currently all hub through Auckland, New Zealand and NZ MPI have confirmed that the entry of live bees into the country, even for transiting, will not be considered given the current lack of systems in place to support official assurance declarations.
- Susceptibility of populations naive to pests and diseases. This has been seen particularly in the trade of NZ bees to Canada where susceptibility to European Foulbrood (exotic to New Zealand) has been observed.

There are a number of reasons why the Honey Bee Sanctuary is worth pursuing. However, at this stage, it is not a commercially viable prospect in its own right if based predominantly on live bee export revenue. Nevertheless, it is still worth preserving a stock of relatively disease free Italian honey bees in the interest of conservation, to support any future regional Apiculture related development projects, and possibly even to act as an insurance policy in the event of a honey bee crisis elsewhere in the world. Additionally, setting up the sanctuary could be leveraged to have some indirect financial benefits to tourism (as it fits into the Niue Eco tourism niche), and to support the Niue Honey marketing story, which will have a flow on effect to the people of Niue through honey sales.

One of the options to support the long term viability of the Honey Bee Sanctuary is to develop export markets for Niuean honey. At this stage, the most cost effective option is to export the honey to New Zealand using the existing Import Health Standard (IHS), and then export from New Zealand using New Zealand based export protocols. However, New Zealand currently has a draft Import Health Standard for bee products which will eventually replace the current standard. Niue honey does not currently meet the requirements of this new standard.

It is the opinion of the author that investment in both the Niue Competent Authority, and the strengthening of Niue Honey's food safety systems to comply with New Zealand Animal Products Act requirements are two immediate funding needs.

Development assistance funding from the New Zealand Ministry of Foreign Affairs and Trade would need a concept identifying the investment opportunity and confirmation from the Government of Niue that this is a development priority for Niue. MFAT would then assess this concept for alignment with relevant MFAT and Government of Niue strategic directions and plans and the Statement of Partnership. If the concept were approved, a business case would then be prepared for funding approval. However, their bilateral funding for the current triennium (18/19-20/21) is close to fully committed based on their current forecast, so if funding was sought in this period trade-offs would need to be made.

Niue is a signatory to PACER plus (Pacific Agreement on Closer Economic Relations plus). The stated aim of the agreement is to create jobs, raise standards of living, and encourage sustainable economic growth in the Pacific region. There is resource available which may be able to be leveraged for export market development in both live bees and bee products.

Areas requiring development support include:

- Training for government officials and Niue Honey Company staff.
- Awareness raising (particularly for tourists).
- Development and maintenance of a honey bee pest and disease surveillance program.
- Support to develop honey markets.
- Determining the Honey bee pest and disease status in Pacific countries.

## ACKNOWLEDGEMENTS

The authors wish to thank Mr Poi Okesene, Director of the Niue Department of Agriculture, Forestry, and Fisheries and his staff for their support of this work.

The author is also indebted to the Niue Honey Company for providing valuable assistance both while on Niue, and in support of the reviewing of this report. Special thanks must go to Andrew Cory (co-founder), and Richard Duncan (advisor) of the Niue Honey Company, who both provided assistance.

Lastly, my thanks to Mr Murray Reid, for his expert insight into beekeeping in the Pacific and the intricacies of live bee export, and his tireless proofing of report drafts.

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## ABBREVIATIONS

| | |
|---|---|
| CCD | Colony Collapse Disorder |
| DAFF | Department of Agriculture, Forestry and Fisheries (Niue) |
| DEPT | Department of Environment, Planning, and Trade (Niue) |
| EU | European Union |
| IHS | Import Health Standard |
| MFAT | Ministry of Foreign Affairs and Trade (New Zealand) |
| MPI | Ministry for Primary Industries (New Zealand) |
| NHC | Niue Honey Company |
| NZG | New Zealand Government |
| OAP | New Zealand's Official Assurance Program |
| OMAR | New Zealand's Overseas Market Access Requirement |
| PACER plus | Pacific Agreement on Closer Economic Relations plus |
| PIFs | Pacific Islands Forum Secretariat |
| PPG | Project Preparation Grant |
| PPP | Public Private Partnership |
| RMP | New Zealand's Risk Management Program for bee product processing facilities |
| SPC | The Pacific Community |
| SPS | Sanitary and Phyto-Sanitary |
| STDF | Standards and Trade Development Facility |
| UK | United Kingdom |

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## 1. Proposal Background

Globally, honey bees are under threat from the increasing prevalence of diseases and parasites, as well as Colony Collapse Disorder (CCD), which has become widespread in the Northern Hemisphere. Niue hosts the last known significant and sufficiently isolated stock of Italian honey bees (*Apis mellifera ligustica*) that are free of all major bee diseases and parasites. Consequently, the bees of Niue have emerged as an increasingly important genetic asset and Niue is an ideal site for a "Bee Sanctuary". Niue is also the perfect country for such a sanctuary in terms of size, small local population, limited number of international visitors, topography, isolation and limited number of ports.

In October 2018, the Standards and Trade Development Facility (STDF) Working Group of the World Trade Organisation approved a project preparation grant (PPG) which focused on supporting the establishment of a Bee Sanctuary in Niue. The PPG was requested by the Niue Honey Company Ltd (NHC), the Department of Agriculture, Forestry and Fisheries of Niue (DAFF), and the Department of Economics, Planning and Trade of Niue (DEPT), which all provided accompanying letters of support. DAFF is responsible for Sanitary and Phytosanitary (SPS) issues and agricultural issues, and DEPT has responsibility for trade issues. The New Zealand Government (NZG) also supports the application and has provided prior support to Niue to carry out disease surveys.

The PPG will be used for assessing the SPS-related requirements and feasibility to establish a "Pacific Bee Sanctuary" in Niue. The key purpose of the feasibility study would be to assess the mix of practices that can reasonably be undertaken, and SPS certifications that can reasonably be obtained, including with respect to the exporting of live bees from Niue, with the view of designating Niue as a "Pacific Bee Sanctuary". Such information would inform the decision about an application for a follow-up STDF project grant.

Establishing a Pacific Bee Sanctuary is expected to have positive impacts on protecting honey bee biodiversity and the genetic purity of the Italian honey bee, developing an alternative and sustainable source of bee imports for the Pacific Islands, augmenting regional agricultural productivity, forming an authentic and compelling communications platform to promote bee health, supporting livelihoods in the Pacific region, and contributing to native bush regeneration, thereby mitigating the effects of global warming and soil degradation.

Niuean honey has been exported to New Zealand ever since the establishment of the industry in the 1960s. Presently, it is the only honey being imported into New Zealand, as it meets the rigorous SPS requirements of NZG. Moreover, there are now sales opportunities in the United States and the United Kingdom. Niue's government, NHC and the New Zealand Ministry for Primary Industries (MPI) are working in close cooperation to strengthen Niue's capacity to meet the SPS requirements of various other international markets. The honey industry in Niue currently operates at about 30% of its capacity in terms of both volume and value added. In addition, due to limited shipping alternatives, all honey from Niue must first be exported to New Zealand, where it is accompanied by all the pre-requisite health certificates issued by the Niuean government.

Further development of the beekeeping industry will require the pro-active role of the Niuean government to establish a "Bee Sanctuary" in Niue, as a platform to increase export values, support new product lines (export of healthy bee-stock), and increase attractiveness vis-à-vis international tourists. However, there is uncertainty on the steps to follow, including in terms of SPS certifications that can reasonably be obtained, to cost-effectively promote Niue as a "Bee-Sanctuary". To sum up, by supporting the Government of Niue and NHC in their endeavor to establish a Bee Sanctuary, this PPG would potentially contribute to the increase of export values from Niue, as well as promoting the Island as a custodian of an important genetic resource.

In approving this application, the STDF Working Group made a number of valuable recommendations including to:

(i) clarify the scope of deliverables and revise the budget;
(ii) clarify how to maximize the benefits of the "Bee Sanctuary" for local beekeepers and invest in their capacity building;
(iii) assess the bee health status and local beekeeping practices in Niue and investigate the effects, if any, of the proposed sanctuary on other insect populations, given Niue's unique ecosystem; and
(iv) reach out to relevant public and private sector stakeholders in Niue and the wider region, including in New Zealand, as well as possible donors and regional organizations like the Secretariat of the Pacific Community and the Pacific Islands Forum Secretariat (PIFs) to identify synergies and possible support for the resulting project.

## 2. History of beekeeping In Niue

*Extract from 'Audit of Niue's Honey Production and Export Arrangements - AsureQuality Ltd and the Ministry of Foreign Affairs and Trade (August 2018)'*

The first hives on Niue Island were established in about 1952 when Bill Marsden of Auckland sent over 15 hives from New Zealand. These eventually died out and another 4 were sent over in 1962 (Muir, 1963). These hives had increased to 15 hives by 1967.

The Niue Honey Company was founded in 1967 as a partnership between the Niue Development Board and a New Zealand beekeeper, Mr J (Mac) Mackisack. Mackisack shipped 55 colonies to Niue from the Waikato region of New Zealand on 10 March 1967 and a further 300 hives in August. Later shipments and managed increase brought the numbers of hives on the island up to 1250.

The business operated profitably building to a maximum production of 75 tonnes of honey from 1250 hives in 1972. Following the death of Mr Mackisack in 1973, management was taken over by DAFF. Production and hive numbers dropped, until in 1986 they were estimated at 450. In late 1991, the equipment and hives were sold to Mr and Mrs Magaoa. However, they were unable to operate the business profitably and hive numbers decreased further to 370 live hives, which were in a moderate to poor condition (Bolger, 1998). The Niue Honey Company New Zealand Ltd purchased the assets of the Niue Honey Company in 1999, including the remnants of the hives, and also brought in another 640 nucleus hives from the Waikato area of New Zealand in June and July 1999.

The company also imported vehicles, new hive parts, machinery and equipment and undertook an extensive re-queening and hive equipment renewal programme from 1999 to 2004 when cyclone Heta devastated the island.

The company melted out most of the old combs and dipped salvageable hive parts in hot paraffin wax at 160°C for at least 10 minutes. These practices are designed to reduce endemic diseases such as *Nosema* and chalkbrood to below pathogenic levels and also eliminate the serious disease of bee larvae called American foulbrood (*Paenibacillus larvae)*. The American foulbrood (AFB) was last detected by Niue Honey Company staff in 2014.

## 3. Size of the Apiculture Industry on Niue

*Extract from 'Audit of Niue's Honey Production and Export Arrangements - AsureQuality Ltd and the Ministry of Foreign Affairs and Trade (August 2018)' with some updates.*

All hives in Niue are currently owned by shareholders operating as the Niue Honey Company Ltd who also claim ownership of any feral or wild hives by virtue of the fact that feral colonies will have emanated from their managed hives. Hive numbers peaked at approximately 2000 hives in 2003.

One tonne of honey was exported to New Zealand in January 2001, five tonnes in April 2002 and 10 tonnes in 2003. Production was severely affected following cyclone Heta in 2004 and exports only resumed in 2006 when nine tonnes of honey was shipped to New Zealand. Since then to the present, exports have averaged around 13 tonnes per year (range 7-20 tonnes). The company expects to have exported approximately 18 tonnes of honey by the end of 2019 and be holding approximately 6 tonnes on island.

In 2004, cyclone Heta decimated Niue's beekeeping operation. Approximately 800 hives were lost due to direct cyclone damage or subsequent starvation as a result of a lack of flowers and no organic sugar for supplementary feed. The honey company also found it difficult to sustain high prices for Niue honey and propolis, which were necessary to cover operational costs and allow for a significant increase in hive numbers.

Niue Honey Company surrendered its organic registration in 2004 as it had to feed non-organic sugar in order to sustain hives and rear queen bees after the cyclone. The organic status was regained in 2012 in an attempt to extract higher prices from niche export markets, especially China. Supplies of organic sugar are now maintained in the honey factory against future cyclones.

In recent years the company has split suitable hives to increase hive numbers and is now running around 2500 hives. Further increase is planned as the company considers that there remains scope for expanding the operation to 8000 hives.

## 4. Rationale for a honey Bee Sanctuary on Niue

In assessing the feasibility of a honey bee sanctuary on Niue, it is important to clearly establish the reasons for establishing a sanctuary by way of desired outcomes. Each outcome can then be assessed in terms of the ability for the outcome to be met with current resources given current conditions, and anticipated future conditions (where possible). Any gaps can be identified and discussed in relation to additional resource needs. Finally, requirements can be attached to each outcome allowing informed decisions to be made on which outcomes could, or should reasonably be pursued.

The outcomes for the Niue Honey Bee Sanctuary identified in the project proposal are as follows:

- Protection of honey bee biodiversity and the genetic purity of the Italian honey bee.
- Establishing a source of honey bee stock with favorable disease status from which commercial exports of live bees could be undertaken.
- Developing an alternative and sustainable source of bee imports for the Pacific Islands.
- Augmenting regional agricultural productivity.
- Establishing the foundations for a potential Pacific Research Centre to further research and development into bee health.
- Forming an authentic and compelling communications platform to promote bee health.
- Supporting livelihoods in the Pacific region.
- Contributing to native bush regeneration, thereby mitigating the effects of global warming and soil degradation.

## 5. Honey Bee Pest and Disease Status in Niue

The most resent honey bee disease survey in Niue was carried out in August 2018 by AsureQuality Ltd (Reid and Taylor) as part of a project funded by the New Zealand Ministry of Foreign Affairs and Trade. A summary of the findings from that survey are presented in the table below. This survey built on the finding from surveys carried out by Reid (1980), Saville (1996), Bolger (1998), Reid and Taylor, (2003), Reid (2005 not published), and Reid (2013). Additionally a limited survey was undertaken by Cahill and Bolder in 2016 as part of the MPI systems audit of the Niue bee products export system.

### Table 1 Status of honey bee pests and diseases in Niue

| Common name | Scientific name | Agent | Niue |
|---|---|---|---|
| American foulbrood | *Paenibacillus larvae* | Bacteria | Last reported in 2014 |
| European foulbrood | *Melissococcus plutonius* | Bacteria | Absent |
| *P. alvei* | *Paenibacillus alvei* | Bacteria | Absent |
| Varroa mite | *Varroa destructor* | Mite | Absent |
| Asian bee mite | *Tropilaelaps clareae* | Mite | Absent |
| Tracheal mite | *Acarapis woodi* | Mite | Absent |
| Small hive beetle | *Aethina tumida* | Insect | Absent |
| Asian honey bee | *Apis cerana* | Undesirable genotype | Absent |
| Africanized honey bee | *Apis mellifera scutellata* | Undesirable genotype | Absent |
| Cape honey bee | *Apis mellifera capensis* | Undesirable genotype | Absent |
| *Nosema* spp. | *Nosema apis* | Protozoan; microsporidia | Present |
| | *Nosema ceranae* | microsporidian | Present |
| Amoeba | *Malpighamoeba* | Amoeba | Unknown |
| Chalkbrood | *Ascosphaera apis* | Fungus | Present |
| Sacbrood | | Virus | Present |

| Common name | Scientific name | Agent | Niue |
|---|---|---|---|
| Chronic bee paralysis | | Virus | Present |
| Black queen cell virus | | Virus | Unknown |
| Kashmir bee virus | | Virus | Unknown |
| Bee virus X | | Virus | Unknown |
| Bee virus Y | | Virus | Unknown |
| Israeli acute paralysis virus | | Virus | Absent |
| Colony collapse disorder | | Unknown - varroa & viruses implicated | Absent |

The current disease status of honey bees on Niue is one of the most favourable in the region and possibly the world. These bees are unencumbered by the Varroa mite (*Varroa destructor)*, present in New Zealand, and the bacterial disease European Foulbrood (*Melissococcus plutonius),* present in Australia. These two diseases are also present in many other countries with significant *Apis mellifera* based beekeeping industries.

Additionally, American foulbrood disease (*Paenibacillus larvae)* has not been detected since 2014, suggesting that, in time it may be possible to declare country freedom from this bacterial disease.

In summary, it appears that the disease status of the Niue Honey Bees is worth protecting. These bees are an ideal source from which to support beekeeping in the Pacific, as they can be kept at low cost and can be managed organically providing an additional trade advantage for any bee products produced.

# 6. Protection of a Honey Bee Sanctuary on Niue

## 6.1. Overview

From a Biosecurity perspective, the establishment and maintenance of a honey bee sanctuary on Niue Island is possible. This is evidenced by the fact that bees have been managed on the island by the Niue Honey Company since the late 1990's with no change in disease status. In addition, it is possible that AFB disease has been eliminated.

There are opportunities to strengthen the biosecurity system to better meet the challenges associated, predominantly with a growing tourist industry. It is recommended that these are considered in the interests of protecting the bee stock into the future.

The Government of Niue, and the Niue Honey Company, are currently in discussions regarding the government purchasing a shareholding in the company. This strengthens the justification for investment in the bee sanctuary concept as the people of Niue have an additional stake in its financial success.

There was widespread support for the Sanctuary communicated via the community consultation meeting. This meeting involved both landowners, Niue Honey company representatives, and representative from various government departments.

## 6.2. Biosecurity Assessment

The author spent some time in Niue during August of 2019 assessing the quality of the biosecurity system as it relates to the protection of a proposed honey bee sanctuary. A number of entry pathways were identified and the quality of protection assessed as far as possible on the basis of interviews and observation.

### 6.2.1.Airport

Niue receives two Air New Zealand flights per week originating out of Auckland. Passengers are profiled via passenger arrival cards and informal questioning at the customs and biosecurity desks. Passengers deemed high risk have their bags x-rayed and/or physically inspected. This inspection happens just to the side of the passenger arrival line and thus, offers a lower level of privacy than what might be considered acceptable.

Biosecurity staff confiscate honey on almost every flight. This could be partly due to the nature of accommodation on Niue (often self-contained guest houses) which may encourage tourists to bring some of their own food. In any case, the frequency of confiscations illustrates a level of ignorance amongst the travelling population. Targeted education / awareness raising prior to travel via marketing material, pamphlets, websites, etc, followed by, targeted material on the plane could further protect a honey bee sanctuary. Niue tourism are looking to produce a short video to play on the plane prior to landing which could include information on the honey bee sanctuary and what must be done to protect it. Additionally amending the passenger arrival card to include a specific declaration for bees, bee products, and items for use in apiculture, rather than it currently being incorporated with other items, could also raise the profile of the risk items and encourage honest reporting. Once off the plane, clear signage advertising the bee sanctuary and outlining risks should also be considered. Lastly, for passengers who, despite all warnings, attempt to enter Niue with bee products, and/or items for use in apiculture, a system of fines could be implemented. Regulations are currently being written to support the issuing of a fine, however it is unknown when these may come into effect.

Confiscated honey is incinerated along with other biosecurity waste on a routine basis.

#### 6.2.2.Port

Matson Shipping provide a sea-freight service throughout much of the South Pacific. Niue is currently part of a monthly shipping circuit that starts in Auckland, New Zealand and typically visits; Nukualofa (Tonga), Lautoka (Fiji), Suva (Fiji), Apia (Samoa), Pago Pago (American Samoa), Rarotonga (Cook Islands), Aitutaki (Cook Islands), Alofi (Niue), and then back to Auckland.

Typically Niue would receive 40-50 containers per visit but recently the numbers have been much higher with 67 arriving while the author was on the island. The harbour is too shallow for the ship to come portside so containers are tendered from the ship via tugboat and barge (soon to be upgraded to a motorised barge). These containers are offloaded and receive a six-sided check portside before being devanned in-situ (observed for a number of cars destined for rental companies), or transferred to another area of the port for later devanning. In some cases containers are shifted off site for devanning. The port is reasonably well controlled from a biosecurity perspective, such as making use of large areas of concrete and undertaking regular insecticide spray programs though there is a plan to improve control via the Maritime Safety Act which, among other things, introduces a harbour master. The harbour master may function as an immigration, customs officer, a quarantine officer, and a fisheries officer. Furthermore, DAFF Biosecurity confirmed that they have fumigation processes and procedures should live animals be found either at the six sided check, or when opening the container. Containers from higher risk areas (eg: Australia) are fumigated prior to being sent to Niue.

Trade development in relation to imports is also a risk that requires effective management. Niue is currently investigating the idea of importing fresh produce from Tonga. While this can be done safely, effective management of the biosecurity risk associated with this trade is critical to the long-term survival of the honey bee sanctuary.

#### 6.2.3.Yachts

Yachts arriving in Niue are obliged to announce their arrival by contacting Niue Radio. Sometimes these calls go directly to the Yacht club or to Niue Customs. Once a yacht has been allocated a mooring, they must make contact with Customs to progress through the arrival procedure. Customs and Quarantine staff will travel out to the yacht to perform inspections and to complete the documentation. Unfortunately, Niue Customs are currently without a boat to undertake this work however NZ MFAT is providing a replacement which will be available in the first quarter of 2020.

Harbour security has been identified as a risk, particularly in relation to the control of yachts and to this end, there is a plan to appoint a harbour master who will be responsible for the management of the area assisting with customs, and biosecurity tasks.

Education is seen as an area for improvement within the local yachting community and the Yacht Club is planning to produce a booklet that can be provided to visiting yacht skippers outlining information important to Niue. This would be another opportunity to provide information on the protection of the bee sanctuary and may also be provided in electronic format via the “noonsite” website, a popular source of information for yacht skippers in the area.

### 6.3. Competent Authority – Department of Agriculture, Forestry, and Fisheries (DAFF)

The concept of a honey bee sanctuary on Niue was discussed with the director of Niue Department of Agriculture, Forestry and Fisheries (DAFF), Mr Poi Okesene.

DAFF is very supportive of the Niue Honey Bee Sanctuary concept, as confirmed by their letter of support progressing this PPG. They have a very good working relationship with the Niue Honey Company, working closely with them around the export of honey to New Zealand, and the import of new beekeeping equipment (woodware) for the purposes of maintenance and expansion of managed bee stocks on Niue.

DAFF also played an active role in the recent honey bee disease survey lead by AsureQuality and funded by the New Zealand Ministry of Foreign Affairs and Trade (Taylor and Reid 2018). The survey provided an opportunity for the training of biosecurity staff in basic beekeeping, sampling procedures, and the identification of pests and diseases of honey bees.

DAFF see that they have an important role to play in all aspects of the sanctuary, from effective border control, to post border surveillance, and eventually to assistance with trade facilitation. However, they also recognise that their level of expertise and resourcing in the area of apiculture would need to be bolstered in order to provide effective support across each of those areas.

### 6.4. Department of Environment Planning and Trade (DEPT)

The concept of the honey bee sanctuary was also discussed with Mr Frank Sioneholo of DEPT. While discussions were predominantly trade related, a position expressed by Mr Sioneholo is that he believes the historic single beekeeping operation on the island should be open to other potential beekeepers.

The position of the Niue Honey Company is that, as they are in possession of a sale and purchase agreement confirming that they purchased all of the honey bees on the island circa 1999, any feral honey bee colony also belongs to them by virtue of the fact that it must have originated from a swarm originating from their hives. However, this view is not necessarily shared by Mr Sioneholo who believe that feral colonies are not owned by anyone.

Based on NHC's assertion of ownership, they believe that other beekeepers cannot take up beekeeping in Niue as they cannot obtain bees from within Niue, and they cannot legally import bees. This position of NHC is held in order to maintain the biosecurity position of the Island, but whilst simultaneously developing a shared ownership model to deliver the wider and compensating financial benefits to Niue.

From a biosecurity perspective, all beehives under the ownership of one entity is a much lower biosecurity risk than a situation where there are multiple owners. As a commercial entity Niue Honey Company has a vested interest in protecting the bee health status of their hives.

Since this discussion, there have been developments in relation to the Niue Government purchasing a shareholding in the Niue Honey company. This is reported to be progressing well and will likely take the form of a Public Private Partnership (PPP) model. Given this new development, it is likely that there will continue to be general acceptance of this beehive ownership arrangement.

### 6.5. Biosecurity Summary

During interviews and observation, several strengths were identified. These included the following:

- Niue is a relatively isolated island with low volumes of freight and passengers crossing the border. Tourist numbers are currently around 10,000 visitors per year and it is the intention to cap the number at 15,000. These visitors arrive predominantly on two commercial flights per week, both originating out of Auckland, New Zealand.
- Niue currently imposes a total ban on imports of honey bees, bee products and used beekeeping equipment. This removes the majority of risk vectors associated with exotic honey bee pest and disease incursion.
- The recent honey bee disease survey confirmed that the disease status of the bee population remains unchanged. This gives some reassurance around the effectiveness of current biosecurity related border security.
- The biosecurity systems and equipment at the airport are fit for purpose as evidenced by the fact that honey and other risk materials have, and continue to be seized and destroyed. However, it was noted that these efforts were somewhat hampered by staff numbers and lack of facilities to undertake bag searches in private.
- The biosecurity systems and facilities at the port were also fit for purpose. There are extensive concrete areas for offloading and devanning containers and the area is sprayed with insecticide regularly. Six sided container checks are carried out port-side and devanning occurs on another area of the port. There is provision for fumigation of the interior of the containers should the need arise though pre-border fumigation, particularly for containers from Australia, is routine.

Along with these strengths, the author identified some areas where improvements could and should be made, particularly as there is a desire to increase tourist numbers over the next few years. Issues include:

- A general lack of education for tourists visiting Niue on biosecurity issues, including those relating to bees and bee products (DAFF are intercepting honey on most incoming commercial flights). Education should be directed into three areas: Pre-travel, travel, and in-country. Pre-travel includes education material directed at potential tourists through websites, travel agencies, and printed tourist advertising. Education during travel could be video clips played prior to landing, information on arrival documentation etc. Lastly, once in country, signage and amnesty bins could be available.
- While the existing DAFF personnel have some training on honey bee pests and diseases, there is no provision for ongoing training around new and emerging threats. In addition to border security, lack of apiculture related expertise is also a limiting factor in the development of any independent post-border surveillance activities to be carried out by the competent authority (DAFF).
- It was noted that existing Biosecurity staff are covering many different areas and industries so the resource is spread very thin. The ability for DAFF to take on additional biosecurity responsibility (particularly post border surveillance) would be challenging given existing staffing levels.

- The management of yachts and general management of the port area is a cause for concern. However, this is an area that has been identified as an issue and there is funding being directed into staffing and a new patrol boat.

It was noted that Niue has implemented, or is in the process of implementing, legislation containing provisions that could provide additional protection and legitimacy to a honey bee sanctuary. These include:

- The Maritime Safety Bill which is currently in draft. Among a number of enhancements, this Bill would see the appointment of a harbour master. This individual could be warranted for the purposes of administering the Biosecurity Act, as well as having customs, and fisheries responsibilities. With the wide responsibilities of the DAFF Biosecurity team, an extra resource to monitor this pest and disease introduction pathway would allow more attention to be directed to other areas.

- The Biosecurity Act of 2016 allows for the declaration of a pest free area for honey bee pests and diseases. This could be done for a significant number of the honey bee pests and diseases of concern worldwide, and in time maybe also for American foulbrood, last reported in 2014, and not found in the 2018 disease survey. This would add legitimacy to the honey bee sanctuary and inform the competent authority on what exotic pests and diseases training is required.

- The Biosecurity Act also allows for the drafting of compliance agreements. There is an opportunity for Niue Honey Company and DAFF to draft a compliance agreement that requires that the Niue Honey Company provides apiary information to DAFF that would constitute an apiary database; and disease inspection declarations. With training, these declarations could be audited by DAFF on a routine basis (say, annually), and by a competent third party, every 2-3 years. This would address one of the recommendations made in the MPI report of 2016 (Cahill and Bolger) and provides additional assurance to NZ MPI and other potential trading partners that the competent authority is exercising appropriate oversight of the beekeeping industry on Niue.

- Niue is also one of 11 Pacific Island Forum countries that are signatories to the Pacific Agreement on Closer Economic Relations Plus (PACER Plus). In addition to Aid for Trade support, PACER Plus has a chapter on Sanitary and Phytosanitary measures for which support can be sought.

The Biosecurity system at the border is providing good protection though it is clear that there is little spare capacity in the system. This is a situation that will need addressing if an equal level of border protection is to be provided at the target tourist volume of 15,000 per annum. Additionally, it is understood that there are ongoing investigations around the possibility of an air service from Tonga. This risk pathway would require effective management of risk as Tonga's apiculture industry suffered the introduction of the Varroa bee mite in approximately 2006.

# 7. Live Bee Trade for the Honey Bee Sanctuary

## 7.1. Overview

It is unlikely that the Bee Sanctuary can support itself predominantly via the sale of honey bee stock, either into the Pacific or further afield in the short to medium term.

Key issues include:

- The lack of a Chief Veterinary Officer, as this is likely to be a requirement for the signing of Official Assurances for many potential trading partners. Additionally, the negotiation of export protocols without technical support would also be challenging. For New Zealand, this is more about DAFF, the Competent Authority, having robust systems in place to support the signing of official assurances.
- Limited transport options. Commercial flights currently all hub through Auckland, New Zealand and NZ MPI have confirmed that the entry of live bees into the country, even for transiting, will not be considered given the current lack of systems in place to support official assurance declarations.
- Susceptibility of populations naive to pests and diseases. This has been seen particularly in the trade of NZ bees to Canada where susceptibility to European Foulbrood (exotic to New Zealand) has been observed. However, it must be noted that this trade continues as this situation is seen as the preferable option when compared to importing bees from a population with a poorer disease status. This would be the situation particularly for Niue's bees in the Pacific.

There are a number of reasons why the Honey Bee Sanctuary is worth pursuing. However, it is not a commercially viable prospect if viewed in the context of revenue from the export of live bees. It is worth preserving a stock of relatively disease free Italian honey bees in the interest of conservation, to support any future regional Apiculture related development projects, and possibly even to act as an insurance policy in the event of a honey bee crisis elsewhere in the world.

Additionally, setting up the sanctuary could be leveraged to have indirect financial benefits to tourism (as it fits into the Niue Eco tourism niche), and to support the Niue Honey marketing story which will have a positive spill-over to the people of Niue through increased honey sales.

## 7.2. Current Trade Situation in Niue

Niue has a published a Trade Policy Framework (June 2016) which has the stated aim of becoming the top government policy to drive the Niue National Strategic Plan's goal on economic development. The framework discusses trade policy by sector and includes the honey sector. Within this, the policy states that government should provide support towards the establishment of a "bee sanctuary". The policy asserts that producing from a healthy bee stock has, and will continue to allow for marketing strategies built around sustainable protection of bee stock. Additionally, the policy sees the development of the bee sanctuary as having a positive effect on tourism.

Niue government is also working on a regional trade program called PACER Plus (Pacific Agreement on Closer Economic Relations Plus). This agreement involves eleven Pacific nations including Australia and New Zealand. The goal of the PACER Plus program is to aid Pacific Island countries to open their economies to trade at a sustainable pace. One of the work programs is to develop quality trade infrastructure including robust certification systems. This could be supported though dedicated Aid for Trade funding which is integral in the agreement. Australia and New Zealand have committed to providing up to 20% of their Overseas Development Assistance for these types of projects. Currently four of the 11 countries have ratified the agreement with a further four required. Once there are eight signatories, the agreement will come into effect after 60 days. NZ MFAT is anticipating at least three more ratifications in the first quarter of 2020.

Niue currently has an Interim Economic Partnership Agreement (IEPA) in place with the EU and are in the process of negotiating a longer term Economic Partnership Agreement (EPA). It is unclear to the author at this stage, what opportunity there is to include bees and bee products as part of this agreement.

The Department of Environment Planning and Trade confirmed that currently there are systems in place for Niue to act on a request for support from a country interested in obtaining honey bees from Niue. It would be up to the importing country to determine whether Niue could meet their import conditions.

### 7.3. Existing and Potential Trade Protocols with New Zealand

At present, the two commercial flights per week that depart from Niue both go to Auckland, New Zealand. Based on this, the entry or transit requirements for Niue honey bees and bee products to New Zealand is a very important component of any trade facilitation. The New Zealand Ministry for Primary Industries (MPI) will currently find it challenging to negotiate any new trade protocol for bees or bee products from Niue.

The current challenge is that the Niue competent Authority (DAFF) does not have a robust system in place to support the official assurance declarations that are currently being made. Nor is it likely that they will be able to support the signing of any new Apiculture related declarations without additional support.

The solution in recent years has been to rely on the results of honey bee disease surveys, and in more recent times, food safety system reviews, to confirm that Niue continues to meet New Zealand's SPS and Food Safety Requirements. While these ad-hoc surveys give the New Zealand authorities confidence that the official assurances received are based on objective evidence (at least for a period of time after the survey has been completed), they are not a good foundation for setting up new trade agreements supported by SPS declaration as it is unknown when the next disease survey will occur. Traditionally, there has been multiple years between surveys resulting in the Niue Competent Authority assuming that their border security is successful, and if there is a disease incursion, that it will be reported by Niue Honey Company staff.

In 2016, a revised Import Health Standard was drafted for the import of bee products, including honey from Niue (which, at the time of writing this report, remains in draft). To assess compliance with the current and proposed Import Health Standards, the New Zealand Ministry for Primary Industries (MPI) commissioned their Systems Audit Team to assess Niue's export system for honey to New Zealand. The findings of this audit concluded that Niue largely met the requirements of the current Import Health Standard for bee products. However, they did make several recommendations and warned that should New Zealand implement the revised Import Health Standard, they would not meet the conditions. While there is no immediate plans to implement this revised standard, should Niue not be in compliance when it does happen, this would be a significant blow for Niue and the Niue Honey Company. MPI have traditionally defended the import of Niue Honey and are hoping that this can continue but acknowledge that Niue will need significant support to meet the requirements of the proposed replacement standard.

Given the previous discussions, there is almost no chance in the current environment, that the New Zealand government would entertain the idea of allowing Niuean Bees to transit through New Zealand enroute to ports further afield. This effectively means that the supply of bees from a sanctuary based in Niue would be restricted to the Pacific Islands in the short to medium term. Longer term supply would have to be dependent on alternative air services visiting Niue though this is unlikely on the basis of current tourism policy (capping visitor numbers at 15,000 pa). Alternatively, New Zealand import policy around live bees would need to be relaxed (also unlikely as New Zealand have not altered their position on live bee imports since the 1950's). These discussions are cementing the idea that the chance of the Honey Bee Sanctuary being financially self-sufficient, if based predominantly on revenue from live bee export, is very unlikely. Additionally, it is the opinion of the Niue Honey Company that, given the developmental importance of apiculture for the region, charging Pacific Island neighbours for bees may conflict with the Pasifika way.

However, the New Zealand government have implemented a policy titled 'Pacific Reset'. The broad goal of this policy is to increase support for New Zealand's Pacific neighbours including Niue. It is unclear at this time to what extent this policy could affect a bee sanctuary.

## 7.4. Live bee export from a Honey Bee Sanctuary in Niue

### 7.4.1.Nucleus Colonies

There are both advantages and disadvantages to the export of bees as a nucleus colony. The advantages are that they travel reasonably well (better than packages), and they are a lot further along developmentally so develop into productive units very quickly.

However, there are significant disadvantages from a biosecurity perspective, and in terms of the size of the unit. It is very difficult to manage the biosecurity risk associated with a nucleus colony. Even accepting the fact that the honey bee disease status is very good, nucleus colonies are built up in regular apiaries. This means that they are harbourages for other insects such as ants and centipedes, skinks etc. Additionally, they can also harbour seeds and other environmental contaminants. It would be almost impossible to eliminate these risks when exporting nucleus colonies.

### 7.4.2.Bulk Bees in Packages

Bulk bees are most commonly supplied to export markets in packages. These packages typically consist of 1-2kg of bees, a queen bee (or a pheromone tab), and sometimes feed. Bees in packages need chilling from the time the packages are filled until they are loaded onto a plane. The aircraft holds used for package bee exports from New Zealand to Canada are pre-chilled before take-off and dry ice is also regularly placed around the packages. Niue does not currently have the capacity for chilling or applying dry ice. The cost of packaging material is significant and technical assistance from the three New Zealand exporters of live bees is most unlikely. Additionally, honey bee populations in the tropics are not as large as in temperate climates, so obtaining enough bees for a shipment may not be practical.

There are also challenges getting export bees to market. Realistically, bees need to be flown to market as they are highly perishable and sea transport from Niue is time consuming. At the time of writing, there are just two commercial flights from Niue per week. Both of these fly to Auckland, New Zealand and discussions with the New Zealand Ministry for Primary Industries (MPI) confirm that the drafting of an import health standard to support the transiting of bees from Niue will not be considered in the current environment. This stems from the fact that MPI has concerns about the ability of the Niue Competent Authority, such as it is, to confidently and competently sign SPS attestations on negotiated official assurances. MPI acknowledges that this is at odds with the current position of accepting Niue's official assurances for honey, however, they are comfortable with the current position based on the recent honey bee disease survey and food safety system report completed in August 2018. MPI views these ad-hoc surveys as temporary solutions to the support of Niuean honey exports and it is the opinion of the author on the basis of these discussions that MPI would be more comfortable discussing existing trade protocols, and new possibilities, if there was a more permanent system in place to support official assurance declarations.

Lastly, it is unlikely that Niue could achieve sufficient economy of scale to make the sanctuary profitable from these exports in the short to medium term. Bulk bee exporters sending bees from New Zealand to Canada typically send 600-700 1kg packages per shipment directly from Auckland to Vancouver. Niue honey would have to transit through New Zealand to move this volume of bees to these markets. Given the additional flight from Niue, and the transiting costs, assuming that transiting could somehow be negotiated in the future, it is unlikely that Niue could compete on cost. It is also unlikely that these markets would pay more for bees with a more favourable disease status as they are going into areas with many established honey bee pests and diseases. Finally, previous discussions with Air New Zealand have established that the aircraft types used at present for flights between Auckland and Niue are not able to accommodate aircraft pallets of the necessary size to make bulk honey bee shipments economic.

### 7.4.3.Queen Bees with Attendants / Queen Cells

Queens are supplied into export markets in plastic queen cages, about the size of a matchbox. The queens are placed in the cage with 6-8 attendant bees and a small amount of feed (candy). Large numbers of queens could be sent and would take up very little space. From a biosecurity perspective, there is less risk sending queens than packaged bees or nucleus colonies.

An even safer option, from a Biosecurity perspective is to send queen cells. These are un-emerged queens which, like a queen, can be introduced into existing colony to improve the genetics.

### 7.4.4.Barriers to the Export of Live Bees

At present, there are significant barriers associated with the large scale export of bees from Niue. These are: the lack of a competent authority to negotiate trade protocols and provide certification, the lack of quarantine facilities to support large scale exports, the lack of suitable commercial air services out of Niue, and the size and geographic restrictions of the sanctuary.

Niue does not currently have a Chief Veterinary Officer. This limits the ability of Niue to negotiate SPS based trade protocols, and provide official assurances attesting to the fact that the protocols have been met. While it is possible that there are jurisdictions in the Pacific, and maybe further afield that are prepared to import bees without established protocols, these opportunities would need to be carefully considered as the unintentional spread of honey bee pests and diseases should be avoided at all costs.

Niue currently does not have quarantine facilities sufficient to support the large scale export of honey bees. However, it may be possible to use the quarantine area at the port as this area is sealed, can be controlled, and is subjected to routine weed control and an insecticide spray program that would limit the chance of ‘hitchhikers ’on export bee packages. Bees exported in packages or as nucleus colonies must be managed to eliminate the unintentional spread of other insects such as ants, insect eggs, seeds, etc.

A final concern was that the honey bees of Niue would be of limited value in areas where the resident population are living with honey bee pests and diseases that Niuean bees have never been exposed to. These ‘naïve ’honey bee populations are often found to be extremely susceptible to such pests and diseases further eroding their worth.

### 7.4.5.Providing Bees for Regional Development

Despite the challenges above, supplying bees into the Pacific for the purposes of regional development may be possible depending on the import requirements of these countries. Niue Honey Company have already been approached by some Cook Island beekeepers to supply bees for the purposes of redeveloping their local apiculture industry.

The advantages in supplying bees into the Pacific are numerous. In most cases there would be no requirement to transit via New Zealand as it would be possible to charter a plane and fly sufficient colonies directly from Niue to other Pacific Islands. This has advantages in that it avoids the need to deal with New Zealand transiting issues, and that the timing of pickup and delivery of the packages is more likely to be able to be controlled to minimise colony loss en-route.

Historically, beekeeping has been looked upon favourably in the context of regional development. The start-up costs are very low when compared with other agricultural or horticultural pursuits, the basic skills necessary to be successful in beekeeping can be acquired readily and are accessible to both men and woman. These facts were important principles underscoring the aid work done around woman in beekeeping in recent history.

Another advantage in using Niue honey bees for regional development is their favourable disease status and their comparatively gentle nature. The most important non-financial criteria for success of beekeeping as a development project is ease of hive management. If the bees are particularly aggressive, or the disease control requirements are too onerous, it is more likely that the bees will be abandoned.

In addition to the ease of management, the generally accepted OIE principle of not unnecessarily spreading pests and diseases into previously uninfected areas makes Niue bees ideally suited to this purpose, and unsurpassed by local honey bee stocks. Both New Zealand and Australian honey bee stocks contain bee pests and diseases that would unnecessarily complicate beekeeping in the Pacific. This has already been seen in Tonga and Fiji, both of which are now dealing with the Varroa mite in their honey bee populations.

It should also be noted that there is little recent information on the disease status of honey bee populations is most Pacific Island nations. Disease surveys are typically ad-hoc and predominantly attached to aid projects. There would be significant benefit in assessing the disease status of honey bee populations in the Pacific as a precursor to developing a regional strategy to support the development / re-development of beekeeping in the Pacific using the Niue Bee Sanctuary as a source of honey bee stock where required.

It is understood that there are no existing or planned activities under bilateral programmes that have particular synergies with the development of a honey bee sanctuary nor any regional activities underway currently. However, this could change depending on future development priorities.

#### 7.4.6.Supply of Honey Bees for Crisis Management

While it appears that the supply of bulk bees to major beekeeping countries is not practical or cost effective in the current environment, this could well change in the event that a beekeeping country suffers a catastrophic event such as what has been observed with colony collapse disorder.

There is merit in maintaining a healthy bee stock as an insurance policy for these events, perhaps in the same way that seed banks are being kept. However, it is unclear at this stage, how this would be funded.

In summary, on the basis of the information available, it appears that the supply of bees for the purposes of regional development and potentially for crisis management present significantly few barriers in the short to medium term. However, the generation of significant export revenue from this activity is unlikely.

# 8. Potential Funding Sources for a Honey Bee Sanctuary in Niue

## 8.1. Honey exports

One of the options to support the long term viability of the Honey Bee Sanctuary is to develop export markets for Niuean honey (and propolis). At this stage, the most cost effective option is to export the honey to New Zealand using the existing Import Health Standard (IHS), and then export from New Zealand using New Zealand based export protocols.

The current Import Health Standard that pertains to the import of honey from Niue is the "Import Health Standard for Specified Processed Bee Products" dated November 2006. Part 7.6 of the standard states:

*Honey from Niue, Samoa, Solomon Islands, Tonga and Tuvalu may be given a biosecurity clearance provided all of the following requirements are met:*

*i. The product must be accompanied by zoosanitary certification issued by the veterinary authority of the exporting country which certifies that: - the honey originates from that country; - the country is free from European foulbrood caused by Melissococcus pluton.*

While MPI continues to accept honey imported from Niue, the lack of a "Veterinary Authority" as previously mentioned, means that compliance with the disease status requirements has to be assessed through alternative means. Most recently, this is via a disease survey completed in August 2018.

The import of honey to New Zealand is also dependent on a robust food safety regime. Taylor and Reid 2018 concluded that, while Niue legislation and Niue Honey Company plant, processes, and procedures, were not sufficient to meet the NZ requirements for the issuing of an Official Assurance (requires honey to be produced in a facility operating a Risk Management Program based on Good Operating Practice and HACCP principles), they could claim equivalence with our domestic standards. Based on New Zealand's current export requirements, this means that Niuean honey shipped to New Zealand could possibly be re-shipped to markets that do not currently require official assurances (eg: USA, Singapore, and Canada).

New Zealand currently has a draft Import Health Standard for bee products which will eventually replace the current standard. This standard states:

*Commercial consignments of products imported into New Zealand for human consumption must comply with relevant requirements of the Food Act 1981 and the Food Act 2014 as it comes into force, the Australia New Zealand Food Standards Code, and the Animal Products Act 1999.*

The Animal Products Act 1999 is the legislation under which the requirements for the processing of bee products eligible for export with an official assurance are administered. As mentioned above, the Niue food safety requirements do not currently comply with this standard, and the Niue Honey Company factory would need significant capital investment to meet this standard.

Additionally:

*Honey of Pacific Island origin*

*(1) Honey from Niue, Pitcairn Island or Samoa may be imported provided that:*

*a) The product is accompanied by a veterinary certificate issued by the Competent Authority of the exporting country certifying that all of the following requirements are met:*

*i) The honey originates from Niue, Pitcairn Island or Samoa.*

*ii) The country is free from European foulbrood caused by Melissococcus plutonius, small hive beetle and Israeli acute paralysis virus.*

*iii) The country is free from American foulbrood or the country has an approved control programme for American foulbrood.*

This would be difficult for Niue to meet at this stage as they cannot claim freedom from American Foulbrood disease (though it was not found in the 2018 survey and the last case was found by Niue Honey Company in 2014 immediately following the 2013 survey) and there is not an approved control program for American Foulbrood Disease in place. Nevertheless, NHC followed NZ practice at the time by reporting the find to both Niue and NZ agencies, as well as destroying the hive in question. Furthermore, NHC reports that they have stopped recycling old hive equipment (the likely source), which has been collected and burnt.

In summary, it is currently possible to export honey to New Zealand and this seems to be the most immediately accessible method of generating funds to support the bee sanctuary (outside of aid funding). However, there is a risk associated with the development of a new Import Health Standard.

It is the opinion of the author that investment in both the Niue Competent Authority (DAFF), and the strengthening of Niue Honey Company's food safety systems to comply with New Zealand Animal Products Act requirements are two immediate funding needs.

The strengthening of the Competent Authority would have the added benefit of improving the ability of Niue to develop trade protocols for live bee exports and support regional development of Apiculture.

Furthermore, support for the implementation of systems to support compliance with the Import Health Standard for Bee Products would both strengthen Niue's position to develop additional export markets for honey and propolis (particularly to official assurance markets) and would make any future discussion or application to transiting bees through New Zealand, more scientifically robust.

Once the ability to export bee products is secure, the company could consider additional development in the area of value added product, particularly packing honey into retail containers. However, this is a significant capital investment and it is the opinion of the Niue Honey Company that securing labour may also be a limiting factor in this development.

### 8.2. Propolis Exports

The Import Health Standard that pertains to the import of honey from Niue also contains provision for the import of propolis. Part 7.4.2 of the standard states:

*Refined propolis products from any country may be given a biosecurity clearance provided all of the following requirements are met:*

*i. The product must not contain honey, pollen or royal jelly*

*ii. The product must be commercially prepared*

*iii. The product must be:*

*a) Packaged in consumer-ready packages for direct retail sale; or*

*b) In manufactured packaging clearly indicating that the total amount of propolis in personal consignments is no more than 2% of the total product weight; or*

*c) Accompanied by a manufacturer's declaration certifying that the product contains no more than 2% propolis; or*

*d) Accompanied by a manufacturer's declaration certifying that the propolis has been extracted from or immersed in ethanol solutions of at least 40%; or*

*e) Accompanied by a manufacturer's declaration certifying that the propolis has undergone one of the indicated heat treatments[1] ; or*

*f) Accompanied by a permit to import: Bulk untreated propolis for further processing must be directed to a bee-proof transitional facility nominated by the importer. The Bulk untreated propolis must be held in an insect proof area as detailed in the facility manual/quality system. The bulk untreated propolis must be encapsulated at the transitional facility listed on the permit. The outer layer of those capsules must not contain any substance that is attractive to bees- including, but not limited to sugar, fruit, honey, pollen or royal jelly.*

The benefit of importing refined propolis is that it can be done with a manufacturer declaration, at least for New Zealand domestic consumption and for export to markets that do not require official assurances, removing the need for certification by DAFF.

The only additional consideration is that propolis in 40% alcohol is considered to be a dangerous good (Class 3 – flammable liquid) so requires special handling for storage and transport.

### 8.3. Ministry of Foreign Affairs and Trade, New Zealand

In April 2019, the New Zealand Government and the Government of Niue signed a "Statement of Partnership" with the stated aim of "…setting out the principles and priorities under which we will co-operate, co-ordinate, and partner in shared priority areas" https://www.mfat.govt.nz/en/countries-and-regions/pacific/niue/our-development-cooperation-in-niue/. One of the current development priorities is to support Niue to achieve sustainable and inclusive economic development. Accepting that the Bee Sanctuary is likely to require either internal (within Niue Honey Company) or external financial support, it may be possible to develop this via support of the marketing and sale of Niuean honey. It is understood that the Government of Niue and Niue Honey Company are currently working towards the government purchasing a shareholding in the company. This development will have an additional positive flow on affect to the welfare of the people of Niue.

Any MFAT development assistance funding would need a concept identifying the investment opportunity and confirmation from the Government of Niue that this is a development priority for Niue. MFAT would then assess this concept for alignment with relevant MFAT and Government of Niue strategic directions and plans and the Statement of Partnership - refer https://www.mfat.govt.nz/en/countries-and-regions/pacific/niue/. If the concept were approved, a business case would then be prepared for funding approval.

However, MFAT did stress that their bilateral funding for the current triennium (18/19-20/21) is close to fully committed based on their current forecast, so if funding was sought in this period trade-offs would need to be made.

### 8.4. PACER Plus (Pacific Agreement on Closer Economic Relations Plus)

In the area of trade facilitation, Niue, along with ten other Pacific Forum countries, is a signatory to PACER plus (Pacific Agreement on Closer Economic Relations plus). The stated aim of the agreement is to create jobs, raise standards of living, and encourage sustainable economic growth in the Pacific region. The PACER plus agreement is cognisant of the variability of disease incidence between signatory countries and incorporates a section on Sanitary and Phytosanitary measures in order to manage biosecurity risk via trade between regions with differing disease status.

There is considerable resource available via both the Australia and New Zealand Official Development Assistance via 'Aid for Trade' which may be able to be leveraged for export market development in both live bees and bee products.

Furthermore, World Bank has expressed interest in this project, and as a contributor to the PACER Plus agreement, suggested that this would be the most effective way of providing assistance for the development of a Honey Bee Sanctuary.

### 8.5. The Pacific Community (SPC)

The Pacific Community (SPC) have a long history of supporting development in Pacific countries. In recent time, SPC have provided assistance to Niue with the import of heavy machinery for road maintenance projects.

SPC have indicated that they may be able to provide assistance around determining the honey bee disease status in the Pacific. Knowledge in this area is currently very limited and this information could assist in determining which Pacific nations to engage with around beekeeping industry development.

### 8.6. Other Possible Funding Sources

Niue is classified as an independent country in free association with New Zealand. Under the 'Pacific Reset 'initiative, government departments have been challenged to view Pacific Islands like Niue as 'domestic partners'. This raises questions as to whether domestic funding sources can be leveraged such as the New Zealand Regional Development Fund. However, there is no decision as to whether a funding application for development in Niue meets the funding criteria at this stage.

## 9. Potential of the Honey Bee Sanctuary to Meet Desired Outcomes

Establishing a source of honey bee stock with favorable disease status from which commercial exports of live bees could be undertaken

There is an already established population of honey bees on Niue and it is possible to provide adequate biosecurity protection for this stock. Furthermore, these honeybees do have a favourable disease status. However, the extent to which commercial exports of live bees could be taken is limited by infrastructure, transport logistics, and certification restrictions.

The fulfillment of this outcome would be in the context of regional development initiatives in beekeeping and crisis management (i.e. if a country suffered a catastrophic loss of honey bee stock).

Protection of honey bee biodiversity and the genetic purity of the Italian honey bee

Niue's biosecurity (border protection) system is designed to protect the resident Italian honey bee population. However opportunities to improve the system to cope with increasing tourist and freight volumes should be considered in the interest of delivering on this outcome in the medium to long term. These opportunities include training of DAFF staff and education of tourists. However, as tourist numbers and freight volumes increase, additional staffing will also need to be considered.

Developing an alternative and sustainable source of bee imports for the Pacific Islands

It will be possible to provide bees for the purpose of regional development as it is likely to be at a scale that is manageable. However, as care will need to be taken to effectively manage non-honey bee biosecurity risks, export of nucleus colonies should be avoided in favour of packages or queen bees. In these cases, use of charter flights would be required. Additionally, improving knowledge of honey bee disease status and the current state of apiculture in the wider Pacific region would be useful to inform a strategy around supplying bees to other Pacific Island countries.

Augmenting regional agricultural productivity.

Honey bees are an extremely important pollinator that can lift production across a range of agricultural crops. Providing a honey bee pollination service to farmers growing insect pollination dependent crops such as melons, mangos, coffee etc. will directly affect livelihoods. Additionally, 'a diverse assemblage of pollinators with different traits and responses to ambient conditions, is one of the best ways of minimizing risk due to climate change. The "insurance" provided by a diversity of pollinators ensures that there are effective pollinators not just for current conditions, but future conditions as well.' (FAO's Global Action on Pollination Services for Sustainable Agriculture, www.fao.org).

Establishing the foundations for a potential Pacific Research Centre to further research and development into bee health

This outcome would be met with the development of the honey bee sanctuary. Researchers in New Zealand have expressed interest in Niue bees and there are a number of research pathways that can reasonably be explored via these and other research links.

Forming an authentic and compelling communications platform to promote bee health

This will form a key part of the marketing story around bee products produced from the honey bee sanctuary but could also be built into the Niue eco-tourism information and biosecurity education for tourists visiting Niue.

Supporting livelihoods in the Pacific region

This is already happening to some extent in Niue as locals do not have to pay for their honey, and landowners are remunerated for providing apiary sites. However, greater support is likely due to the Niue Government working towards becoming a shareholder in Niue Honey Company via a Public Private Partnership model (PPP). Additionally, pollination services both locally (Niue) and regionally through development could also directly support livelihoods in the Pacific.

Contributing to native bush regeneration, thereby mitigating the effects of global warming and soil degradation.

This is very difficult to anticipate as bees are exotic to the Pacific and therefore native bush does not typically rely on honey bee pollination. However honeybees have been observed collecting pollen and nectar from native flora, including the coconut tree, and pollinator diversity is acknowledged as extremely important in an environment of climate change. Developing and maintaining honey bee populations adds to this diversity.

# 10. Support Required to Meet Desired Outcomes

## 10.1. Training

Working on the premise that in the medium to long term the Niue Honey Bee Sanctuary should be, as much as possible, supported from within Niue (Niue Honey Company and DAFF predominantly), the success of this project is dependent on effective and ongoing training. Realistically, this training could be facilitated via a project grant in the short term, but would need to be a managed expense in the longer term. There are a number of training needs across both Niue Honey Company staff and Niue DAFF. These include:

- Niue Honey Company
    - Training in identification of honey bee pests and diseases exotic to Niue
- DAFF
    - Training in identification and management of introduction vectors for honey bee pests and diseases exotic to Niue
    - Training in basic beekeeping for the purposes of independent disease checks
    - Training in identification of honey bee pest and diseases exotic to Niue
    - Training and assistance with the drafting and implementation of an effective surveillance program for honey bee pests and diseases.

Ongoing support from third party agencies such as AsureQuality (AQ) for audit and continuous development of the surveillance program.

## 10.2. Awareness Raising (Particularly for Tourists)

Support for awareness raising measures will need to be considered to improve border security. Border interceptions indicate a general lack of awareness around honey bee biosecurity among tourists.

Awareness raising measures identified for development include:

- Publishing material in tourism websites and printed material
- Information on commercial flights such as in-flight video, and passenger arrival information. This could also involve amending the passenger arrival declarations to include a specific section on bees and bee products.
- Signage at the airport on arrival
- Information published in a booklet for yacht crew.

## 10.3. Development and Maintenance of a Surveillance Program

In order to support the export of bees and bee products from Niue, the Competent Authority (DAFF), will require assistance to develop and maintain systems to support trade negotiations and the issue of existing, and yet to be developed, official assurances. This will take the form of a regular disease survey (annual would be best), and the management of an apiary database to support this activity.

It is unrealistic to expect DAFF to retain specialised Apiculture staff but, with some training (as mentioned above), and periodic audit by a competent third party, a robust system could be developed.

### 10.4. Support to Develop Honey Markets

Honey sales appear to be a sensible long term funding mechanism for a Honey Bee Sanctuary. Supporting Niue Honey Company to develop export markets for the honey would aid in ensuring the long term survival of the sanctuary.

This support could be scaled to suit available budget but the highest level of support would include support for significant development of the honey factory to meet the New Zealand Animal Products Act standards, and thus, removing a barrier to the supply of product into markets requiring official assurances (eg: EU, China, Japan etc).

In return, the sanctuary could be used as part of a marketing strategy to further enhance the impression of Niue Honey as a high end niche product.

### 10.5. Determining Honey Bee Disease Status in Pacific Countries

Niue Honey Company have been approached by beekeepers in the Cook Islands to supply honey bees for development. While this will still require the involvement of both governments to progress, it is an encouraging first step to support continued regional development of apiculture in the Pacific.

Establishing a plan around regional development would be beneficial. Information on the disease status of bees in the Pacific is currently based on old or incomplete information and would be a critical first step in developing this plan. Funding agencies such as the Pacific Community (SPC) could be approached to assist with this.

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