

5.12. FLYING FOX ISSUE PORT DOUGLAS

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RECOMMENDATION

That council resolve to grant permission to Niramaya Villas and Spa, to make application for a permit for flying fox roost management directly to Department Environment Heritage and Protection, with all works and actions being undertaken by Niramaya Villas and Spas at their cost.

EXECUTIVE SUMMARY

The Douglas Shire Council appreciates that flying-fox roosts can be a source of unpleasant noise and smells in some places and recognises the need for flying-fox management arrangements to achieve a balance between addressing the concerns of impacted residents with the need to protect and retain flying-fox populations in the wild which play an essential role as pollinators for many native plant species.

The current flying-fox management framework gives local governments the right to disperse, remove or otherwise manage flying-fox roosts in designated urban flying-fox management areas (UFFMA) using non-lethal measures only and subject to a code of practice, the permission of relevant landholders and other applicable laws.

This report aims to address on ongoing concerns raised by Niramaya Villas and Spa Port Douglas by finding the balance point where community well-being is protected and flying-fox sustainability and welfare is not threatened.

BACKGROUND

Flying-foxes are crucial to keeping native forests healthy. They play an important role in dispersing seeds and pollinating flowering plants. This reinforces the gene pool and health of native forests. In turn, native forests provide valuable timber, act as carbon sinks, and stabilise river systems and water catchments, and provide recreational and tourism opportunities worth millions of dollars each year.

Flying-foxes are native nocturnal mammals that tend to travel significant distances during the night foraging in search of food (nectar and fruit), and congregate during the day for rest (or for breeding, at certain times of the year). The sites where they congregate are known as roosts or roost sites.

Flying-foxes are social animals usually living in large roosts. The roosts can be as small as a dozen animals but sometimes numbering in the tens or hundreds of thousands. Roosts are often semi-permanent, sometimes dispersing seasonally or when food is no longer available nearby, or when an area is overtaken by the impacts of encroaching development.

The Douglas Shire area contains several long term roost sites located throughout urban areas such as Port Douglas and Wonga.

Council has recently received numerous requests for assistance from the management committee and residents of Niramaya Villas and Spa to trial a solution to prevent the ongoing issues caused by the flying fox colony. The impacts include:

- Health issues (lack of sleep due to noise levels).
- Complaints from guests, loss of business.
- Damage to infrastructure from defecation.

The flying fox colony is currently located on thin strip of council reserve described as Bale Drive Port Douglas Lot 90 1SP165909 owned by the Douglas Shire Council.



Figure 1.

There are currently two flying fox roosts on site as can be seen in the map pictured above. The colony does shift regularly to several locations within Port Douglas but returns to this site each year causing ongoing issues for Niramaya Villas and Spa.

COMMENT

Local governments have an as-of right authority under the Nature Conservation Act 1992 (the Act) to manage flying-fox roosts in Urban Flying-Fox Management Areas (UFFMA). The as-of-right management activities are limited to non-lethal methods, and may only be undertaken in accordance with the Code of Practice - Ecologically sustainable management of flying-fox roosts . See attachment 1.

The Flying fox Roost Management Guidelines assists councils in decision making regarding management options at flying fox roosts. See attachment 2.

PROPOSAL

Niramaya Villas and Spa are willing to fund at their expense a trial deterrent operation involving the use of lights to push the flying foxes from roost 1 towards roost 2 as pictured above away from the residents in the villas.

Three options were considered for council on the decision whether or not to take action and implement roost management activities.

1. Works would occur under council's banner as an as-of right authority. Council is required to provide DEHP with 48 hours notice prior to taking action.
2. Niramaya Villas and Spa make application for a permit for flying fox roost management directly to Department Environment Heritage and Protection with permission form Douglas Shire Council as the landholder.
3. No operational works to be taken. Council staff to monitor frequently, provide information & education and community liaison

On review of all options, it is recommended that Council would proceed with Option 2, with Niramaya Villas and Spas undertaking the works following their application to the Department of Environment and Heritage.

FINANCIAL/RESOURCE IMPLICATIONS

Council has no allocated funds available in the 2017 /2018 operational budget for flying fox roost management. Niramaya Villas and Spa are willing to fund the full expense of the operational works if approved.

RISK MANAGEMENT IMPLICATIONS

Due to fact we are dealing with wild animals there is potential that activities may not always have the desired results. Many factors must be considered prior to deciding to take action. Some examples include:

- The wellbeing impacts and concerns that nearby residents are experiencing.
- The likelihood of flying-foxes relocating to a site of greater conflict with the community.
- Whether a proposed management action may cause harm to flying-foxes.
- The cost of various management actions, and who would contribute to these costs.
- The precedent set for action required in similar / future situations across the Douglas Shire area.

SUSTAINABILITY IMPLICATIONS

Economic:

Flying fox management options are expensive and can be ongoing. Quotations received from suitably qualified dispersal contractors estimate costs at \$3000 per seven days of works. Other local councils engaged in roost management activities also enlist additional services from a professional ecologist to ensure compliance with the code of practice. Application permits also require a substantial fee to be paid to the Department of Environment Heritage and Protection. Council has no allocated budget for flying fox management. Niramaya Villas and Spa is willing to pay all associated costs for the proposed operational works.

Environmental: There are four species of flying-fox commonly found in Queensland all of which are protected under the Nature Conservation Act 1992 (the Act).

Spectacled flying-foxes are also listed as vulnerable under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. As the colony at Port Douglas contains spectacled flying-foxes, consultation with the Commonwealth Government will be required and may be subject to a referral under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Social: Living next door to thousands of animals can be very difficult when they are active and noisy at night, prone to smell, eat the fruit from your trees and damage your infrastructure from defecation.
The survival of flying-foxes depends on our ability to live with them. From a public health perspective, in almost all circumstances there is no reason to be alarmed if a colony moves in nearby. Queensland Health advises that there is no evidence that Hendra virus can be passed directly from flying-foxes to humans, from the environment to humans, from humans to horses, or that it is airborne.

CORPORATE/OPERATIONAL PLAN, POLICY REFERENCE

This report has been prepared in accordance with the following:

Corporate Plan 2014-2019 Initiatives:

Theme 1 - Celebrating Our Communities

1.2.4 - Network, advocate and partner with stakeholders to achieve positive outcomes.

COUNCIL'S ROLE

Council can play a number of different roles in certain circumstances and it is important to be clear about which role is appropriate for a specific purpose or circumstance. The implementation of actions will be a collective effort and Council's involvement will vary from information only through to full responsibility for delivery.

The following areas outline where Council has a clear responsibility to act:

Advocate	Supporting communities and groups by advocating for certain actions from other organisations (usually other levels of government)
Asset-Owner	Meeting the responsibilities associated with owning or being the custodian of assets such as infrastructure.

CONSULTATION

Internal: The issue was presented / discussed at the councillor workshop held on 06/06/2017.

External:

On 22/05/17 a site meeting was held between stakeholders to assess the impacts and investigate potential solutions and the most appropriate course of action. Present at the meeting was DEHP Wildlife Rangers, Niramaya committee representatives, a private bat dispersal contractor and Council's Coordinator Open Spaces. The group conducted an inspection of the two roosting sites and assessed the impacts using council's Flying fox Assessment Matrix. See attachment 3.

The results of the assessment indicate that intervention is required.

COMMUNITY ENGAGEMENT

Further consultation will take place with the wider community as per councils community engagement policy should the approval for operation works to occur be granted by council and the Department Environmental Heritage and Protection.

ATTACHMENTS

1. Code of practice -roost-management **[5.12.1]**
2. Flying Fox Roost Management Guidelines **[5.12.2]**
3. Flying Fox Assessment Niramaya 2017 **[5.12.3]**

Code of Practice
Ecologically sustainable management
of flying-fox roosts
Nature Conservation Act 1992

Code of Practice

Ecologically sustainable management of flying-fox roosts

Prepared by: Nature Conservation Services Branch, Department of Environment and Heritage Protection

Approved in accordance with section 174A of the *Nature Conservation Act 1992*

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Acknowledgements

This code of practice has been prepared by the Department of Environment and Heritage Protection in consultation with local government representatives, both elected and official, conservation groups, relevant government agencies, ecological consultants and members of the public.

November 2013

Ecologically sustainable management of flying-fox roosts

1. Purpose and operation of this code

- 1.1 The purpose of this Code of Practice— Ecologically sustainable management of flying-fox roosts (**‘the Code’**) is to ensure that the chance of *management actions* under this code resulting in harm to flying-foxes is minimised and that appropriate welfare standards are upheld.
- 1.2 This code sets out how, in the course of undertaking *management actions* at flying-fox roosts in accordance with section 41A of the Nature Conservation (Wildlife Management) Regulation 2006, local government, may:
 - 1.2.1 destroy a flying-fox roost
 - 1.2.2 drive away, or attempt to drive away, a flying-fox from a flying-fox roost
 - 1.2.3 disturb a flying-fox in a flying-fox roost.
- 1.3 This code also applies to persons or local governments operating under a flying-fox roost management permit, where the permit requires them to comply with this code.

2. Prescribed methods for management actions

- 2.1 The Department of Environment and Heritage Protection (EHP) must be notified at least two business days prior to commencing any *management actions* by completion of the flying-fox roost management notification form on the EHP website. However, management actions may be commenced earlier than two business days following completion of the flying-fox roost management notification form on the EHP website if an *authorised person* gives written notice to that effect.
 - 2.1.1 This notification is valid for all dispersal activities conducted in relation to a roost within a two week timeframe from the date of notification, including dispersal activities conducted at a different location which are required to manage any impacts from dispersing the target roost.
 - 2.1.2 If commencement or continuation of activities is delayed beyond this two week timeframe, a further notification advising the new proposed commencement date and time is required.
- 2.2 No roost tree may be destroyed or modified when there are flying-foxes in the tree, or when flying-foxes are near to the tree and likely to be harmed as a result of the destruction or modification.
- 2.3 All *management actions* must immediately cease, and EHP be immediately notified if flying-foxes appear to have been killed or injured.
- 2.4 During *management actions*, any attempt to drive away flying-foxes:
 - 2.4.1 Must be properly coordinated to ensure all actions are lawful and in compliance with this code
 - 2.4.2 May only commence after advice from a *person knowledgeable about flying-fox behaviour*, or with such a person present
 - 2.4.3 May only occur in the early evening and/or early morning
 - 2.4.4 When being carried out in the early evening, must commence immediately prior to dusk ‘fly-out’ at a roost and continue for no longer than 2 hours
 - 2.4.5 When being carried out in the early morning, must commence immediately when flying-foxes start returning to a roost from foraging activities, and continue for no longer than 3 hours
 - 2.4.6 Must be limited to the non-lethal deterrence methods of smoke, noise, light, foggers, BirdFrite and ‘scarecrow’ type devices only.

Code of Practice

Ecologically sustainable management of flying-fox roosts

3. Definitions

Act— the *Nature Conservation Act 1992*.

Authorised person— means any of the following—

- (a) the chief executive, performing functions under the Act
- (b) a public service employee of the department performing functions under the Act for the chief executive
- (c) a conservation officer who is not an employee of the department and who is performing functions under the Act for the chief executive.

Management actions— means non-lethal actions intended to stop flying-foxes from making use of a site or part of a site, and include destroying and/or modifying vegetation at a site, as well as coordinated action to drive flying-foxes away from a site.

Person knowledgeable about flying-fox behaviour— means a person able to demonstrate experience of, or a methodology for:

- (a) classifying flying-fox species
- (b) assessing flying-fox population numbers in particular roosts
- (c) identifying flying-fox breeding cycles including evidence of breeding and rearing activity in particular roosts
- (d) recognising signs of distress in, or harm to, flying-foxes.

Roost or flying-fox roost— means a tree or other place where flying-foxes congregate from time to time for breeding or rearing their young.

Flying-Fox Roost Management Guideline

Queensland

Prepared by: Nature Conservation Services Branch, Department of Environment and Heritage Protection

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Table of contents

1. Purpose of this guideline	4
2. General information	4
3. Statement of management intent.....	4
4. Deciding the best management approach	6
5. Minimal intervention	7
6. In-situ management.....	8
7. Dispersal	10
8. Coordination and advice.....	13
9. Accidents and emergency situations	13
10. Further reading	13
Appendix A: Flying-fox identification and distribution maps	14
Appendix B: Monitoring report	17
Appendix C: Outcome report	18

1. Purpose of this guideline

- 1.1. This Flying-Fox Roost Management Guideline (this guideline) has been prepared by the Department of Environment and Heritage Protection (EHP).
- 1.2. The purpose of this guideline is to provide Local Government with information that will—
 - 1.2.1. assist decision making regarding management options at flying-fox roosts,
 - 1.2.2. maximise the efficacy of various management actions at flying-fox roosts, and
 - 1.2.3. minimise the likelihood of management actions at flying-fox roosts causing harm to flying-foxes.
- 1.3. The guideline provides information only. Not all recommended actions will be relevant to all roost management activities.

2. General information

- 2.1. Flying-foxes are native nocturnal mammals that tend to travel significant distances during the night foraging in search of food (nectar and fruit), and congregate during the day for rest (or for breeding, at certain times of the year). The sites where they congregate are known as roosts or roost sites.
- 2.2. Flying-fox foraging plays a significant role in pollination and seed dispersal for native vegetation.
- 2.3. There are four species of flying-fox commonly found in Queensland - the black flying-fox *Pteropus alecto*, grey-headed flying-fox *P. poliocephalus*, little red flying-fox *P. scapulatus* and spectacled flying-fox *P. conspicillatus* - all of which are protected under the *Nature Conservation Act 1992* (the Act). The grey-headed and spectacled flying-foxes are also listed as vulnerable under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.
- 2.4. Though highly mobile, flying-foxes tend to develop strong affinities with roost sites. Individual animals may use a different roost site on a short term (even nightly) basis but roost sites themselves are relatively more stable. Nonetheless the presence and number of animals at a roost site can change with seasonal conditions and the availability and distribution of food across the landscape.
- 2.5. Some communities have large flying-fox roosts in, or close to, urban areas (e.g. in town parks or cemeteries). Many of these places are known to EHP and to local authorities, and are mapped and monitored. Roosts in urban areas can be objectionable to nearby residents due to the level of noise and smell generated.
- 2.6. Some flying-foxes also carry the Australian Bat Lyssavirus, a rabies-like virus and have also been recognised as playing a role in the transmission of Hendra Virus to horses. While these two viruses represent a concern for some members of the community, the health risks are known to be minimal.
- 2.7. For further information relating to flying-foxes and human health please refer to the Queensland Health website at: <<http://www.health.qld.gov.au>>
- 2.8. See [Appendix A](#) for further information of identification and distribution of species.

3. Statement of management intent

N.B. this section applies to local governments only.

- 3.1. The Minister may require a local government to develop a Statement of Management Intent (SoMI) in relation to its plans for roost management. The SoMI enables a local government to declare to its community how it intends to discharge its as-of-right authority to manage flying-fox roosts across its urban areas.
- 3.2. The SoMI may include a broad, general statement of management intent for all flying-fox roosts within the Urban Flying-fox Management Area (UFFMA). Some local governments may also wish to include a

Flying-fox roost management guideline

general statement for the areas outside the UFFMAs.

3.3. The SoMI may include advice to residents that, under the relevant code of practice, Council is authorised to use non-lethal methods to—

- 3.3.1. Destroy a flying-fox roost,
- 3.3.2. Drive away, or attempt to drive away, a flying-fox from a flying-fox roost, and
- 3.3.3. Disturb a flying fox in a flying-fox roost.

The Code of practice – Ecologically sustainable management of flying-fox roosts is available at the following webpage <http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management.html>

3.4. The SoMI may include details of factors that Council would consider before deciding whether to take any action at particular sites, such as:

- 3.4.1. The wellbeing impacts and concerns that nearby residents are experiencing,
- 3.4.2. Whether there are any risks to human health or wellbeing, and
- 3.4.3. Whether the roost is on Council land or private land, and if private land, whether consent for Council to undertake management has been provided by all landholder(s).

3.5. The SoMI may include details of additional factors that Council would consider in deciding the most appropriate action to take at particular sites, such as:

- 3.5.1. The cost of various management actions, and who would contribute to these costs.

N.B. Potential management actions can range from minimal intervention, through to moderate vegetation modification, through to complete clearing of roost vegetation and driving flying-foxes away. Costs increase significantly with greater management interventions.

- 3.5.2. The number of each species of flying-foxes at the roost, and what the council's intention would be should the flying-foxes be breeding or rearing their young.
- 3.5.3. The status of the flying-fox species under the *Nature Conservation Act 1992* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
- 3.5.4. Whether good outcomes may be achieved with minimal management interventions (such as community education) or moderate management interventions such as “nudging” or “buffering”, processes by which the impact of an existing roost may be managed by its reduction.

3.6. The SoMI may include details of further factors that Council would consider, where Council decides, for particular sites, that the most appropriate action is dispersal, such as:

- 3.6.1. The number of years that flying-foxes have used a particular roost site. N.B. Flying-foxes are known to have strong affinities with roost sites, and driving flying-foxes away from an established roost may, in some circumstances, prove challenging and resource intensive.
- 3.6.2. The likelihood of flying-foxes relocating to a site of greater conflict with the community.
- 3.6.3. Whether flying-foxes at the site are capable of independent flight at the time of year proposed for driving them away.
- 3.6.4. Whether a proposed management action may cause harm to flying-foxes.

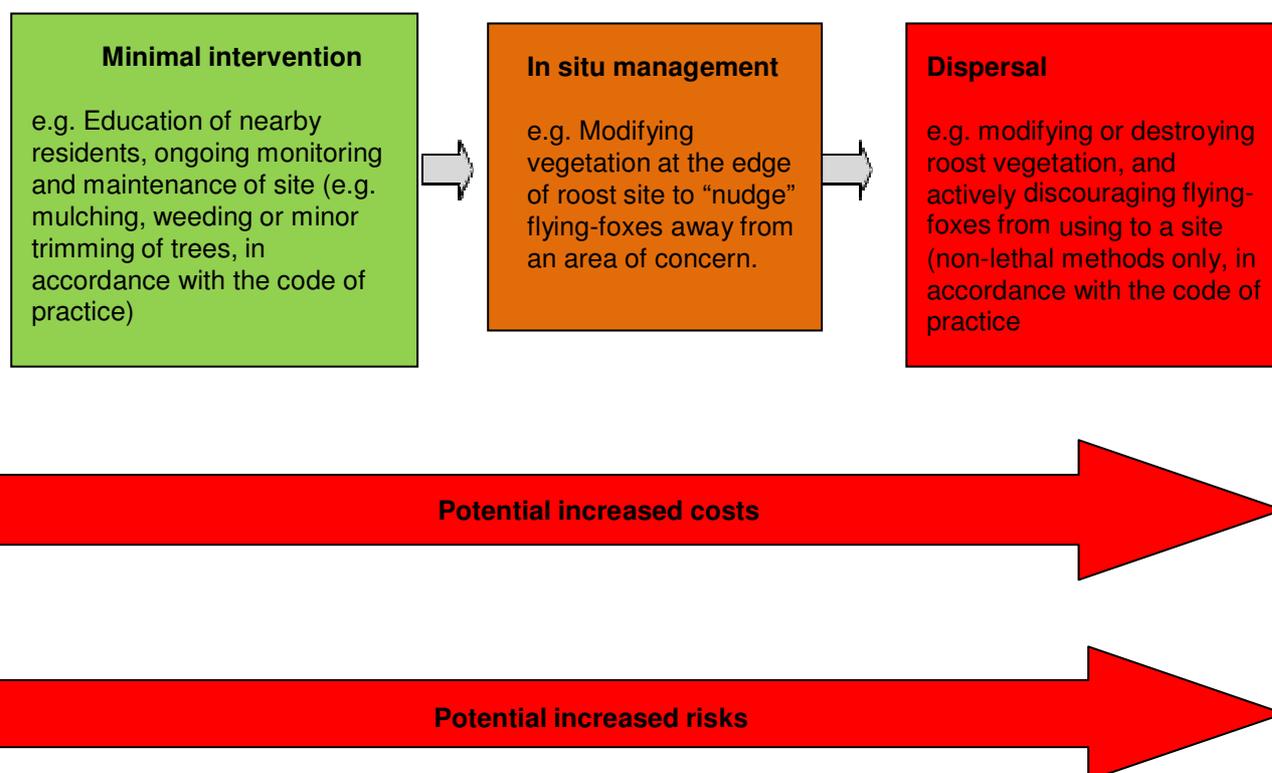
3.7. The SoMI may also advise residents, that if a roost is on private land(s), low impact activities may be undertaken by the landholder(s) as-of-right under the relevant code of practice. The Code of practice – Low impact activities affecting flying-fox roosts is available at the following webpage <http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management.html>

- 3.8. The SoMI may include advice to residents that, should they be dissatisfied with Council's approach at a particular roost site, they may apply for a permit directly from EHP. The *flying-fox roost management permit application form* is available at the following webpage
<http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management-permits.html>

4. Deciding the best management approach

- 4.1 Once it is determined that some type of management action is required at a particular roost, there are a range of factors to consider in determining the best approach:
- 4.1.1 Is the management action authorised as-of-right, or if not, has a permit been obtained from the department?
 - 4.1.2 Will the management action comply with the Code of Practice?
 - 4.1.3 What will be the potential impacts of the management action on community members near the site? What are the potential impacts on community members in the wider surrounding area?
 - 4.1.4 What are the potential costs of the management action?
 - 4.1.5 What unique factors exist at the site that might influence the management action?
 - 4.1.6 Which species use the camp site?
 - 4.1.7 Is the camp occupied permanently, seasonally or irregularly?
 - 4.1.8 Is current usage consistent with historical use?
 - 4.1.9 Are the flying-foxes currently breeding or rearing their young?
- 4.2 Breeding and rearing seasons
- 4.2.1 Particular consideration should be given to avoiding major activities at flying-fox roosts during breeding and rearing seasons.
 - 4.2.2 Reproduction in all Australian flying-foxes is seasonal and usually synchronous. The reproductive cycle of black, spectacled and grey-headed flying-foxes approximately commences in January, with conception usually in April or May. Females give birth to single pups in October or November and lactate until approximately March. These dates are indicative and can vary by a month or two regionally. In South-East Queensland, for example, consider scheduling works between May and July, however this may differ in other regions.
 - 4.2.3 The breeding cycle of the nomadic little red flying-foxes is out of phase with the other species by about six months.
 - 4.2.4 Individual flying-foxes reach reproductive maturity in the second or third year of life. This low reproductive potential inhibits the capacity of flying-foxes to recover from population declines.
 - 4.2.5 Reproduction in flying-foxes can be disrupted by activities at roosts, and where possible activities should be avoided when flying-foxes are in late stages of pregnancy, or rearing their dependent young.

4.3 Some management approaches to consider include the following:



4.4 Where minimal intervention is the preferred approach, section 5 provides further information.

4.5 Where in-situ management is the preferred approach, section 6 provides further information.

4.6 Where dispersal is the preferred approach, section 7 provides further information.

5. Minimal intervention

5.1. Where minimal intervention is the chosen management approach, consider community education (particularly for the nearby residents), ongoing monitoring of the site, and regular maintenance of the site.

5.2. Community education may include contacting the residents that raised the concerns and explaining the reasons for the chosen management approach. It may also include providing educational material to all nearby residents.

5.3. Monitoring may include a regular count of flying-foxes of each species at the roost and recording the times of the year that breeding and rearing activities are occurring (see [Appendix B](#) for an example template for recording results of regular monitoring).

5.4. Regular maintenance may include mulching, mowing, weeding and minor trimming of trees, much of which may be authorised to be undertaken under the Code of practice – Low impact activities affecting flying-fox roosts.

5.5. Mulching, mowing and weeding at (or adjacent to) a roost

5.5.1. Where possible, park vehicles and equipment away from direct line of sight of roosting flying-foxes.

5.5.2. Consider avoiding the use of brush cutters and large crews.

Flying-fox roost management guideline

- 5.5.3. Consider engaging a 2-person crew, with a single person undertaking works (e.g. operating a mower, or weeding), and a second person as a 'spotter' to observe the activity of the flying-foxes for the purposes of ceasing work at the first sign of flying-fox disturbance (i.e. if flying-foxes become agitated and/or start to lift).
 - 5.5.4. Consider commencing works at the furthest end from the flying-foxes, and working slowly towards the roost, or alternatively, leaving the area nearest the flying-foxes until early evening (after dusk 'fly out').
 - 5.5.5. Consider having grassed areas adjacent to flying-fox roosts mowed before breeding season. Alternatively consider mulching and/or planting a buffer (e.g. 10 metres) of low growing vegetation to alleviate the need for ongoing mowing activities.
 - 5.5.6. Where possible, remove weeds by hand, or spray weeds (or inject woody weeds) and leave them in place.
- 5.6. Trimming of trees at a roost and vegetation modification next to a roost
- 5.6.1. Consider scheduling activity for when the roost is unoccupied, i.e. when the bats have left the site at dusk for nightly foraging activities, or for non-permanent roosts, when the roost is seasonally unoccupied.
 - 5.6.2. If works are to be conducted when flying-foxes are present, consider:
 - 5.6.2.1. Engaging a 2-person crew, with a single person undertaking works (e.g. operating a mower, or weeding), and a second person as a 'spotter' to observe the activity of the flying-foxes for the purposes of ceasing work at the first sign of flying-fox disturbance (i.e. if flying-foxes become agitated and/or start to lift).
 - 5.6.2.2. Clearly identifying the tree/s which are not to be affected.
 - 5.6.2.3. Minimising the use of loud machinery or equipment that produces sudden impacts or sudden loud sounds.
 - 5.6.2.4. Using cut vegetation as mulch for the roost site.
 - 5.6.2.5. If chainsaws are needed, starting the chainsaw away from the roost and letting it run for a short time to allow flying-foxes to adjust. Then moving closer to flying-foxes and repeating.
- 5.7. Fire Management
- 5.7.1. Where possible, planned burns in the vicinity of a flying-fox roost should be scheduled when roost sites are unoccupied.

6. In-situ management

- 6.1. Where in-situ management is the chosen approach, consider creating a buffer between an area of community concern and the roost, by destroying or modifying a part of the roost, and planting that area with vegetation that is unsuitable for roosting.
- 6.2. Note requirements under the relevant code of practice, and consider having a copy of the code and this guideline on site during all works. The Code of practice – Ecologically sustainable management of flying-fox roosts is available at the following webpage
<http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management.html>
- 6.3. Pre in-situ management
 - 6.3.1. Consider appointing a person to coordinate the works on site each day.

Flying-fox roost management guideline

- 6.3.2. Consider creating a map of the area, centred on the roost site and including the immediate surrounds. Where possible, use cadastral boundaries and overlay with satellite imagery. Where possible, identify the approximate total area of the roost, the approximate area that would need to be modified/destroyed to create a suitable buffer (e.g. 10 metres), and whether there is a suitably sized replacement area available for the displaced flying-foxes.
 - 6.3.3. Consider a site visit to ground truth the mapping and to have a suitably qualified/skilled person conduct a 'planning count' at the site, making a record, for each flying-fox species present, of the total number of flying-foxes, the number of pregnant females and the number of dependent young (see [Appendix C](#) section 1 for an example of how to record count results). Additionally, if a suitably sized replacement area has not been identified via the mapping, consider identifying whether there is sufficient carrying capacity in what would remain of the roost to support the number of flying-foxes at the site.
 - 6.3.4. Where pregnant females or dependent young are present, consider delaying works. If the roost is only seasonally occupied, consider undertaking works when the roost is unoccupied. If the roost is continually occupied, consider planning for night works outside of peak breeding and rearing seasons.
 - 6.3.5. Where a significant area of the roost is planned to be modified/destroyed (for example, greater than 10%), consider staging works over multiple nights, with no greater than 10% of the roost modified/destroyed in any one night. This will minimise the risk of flying-foxes abandoning the roost and moving to a new site, which may be equally or more unsuitable.
 - 6.3.6. If any works are planned to be conducted when flying-foxes are present (e.g. during the day):
 - 6.3.6.1. Consider engaging a 2-person crew, with a single person undertaking works (e.g. operating a mower, or weeding), and a second person as a 'spotter' to observe the activity of the flying-foxes for the purposes of ceasing work at the first sign of flying-fox disturbance (i.e. if flying-foxes become agitated and/or start to lift).
 - 6.3.6.2. Consider minimising the use of loud machinery or equipment that produces sudden impacts or sudden loud sounds.
 - 6.3.7. Consider engaging a wildlife carer, inoculated for Lyssavirus. If a wildlife carer is not engaged, it should be noted that wildlife carers (or other members of the public) are lawfully able to observe activities on, or from, public land.
 - 6.3.8. Consider if any landholder approvals may be required.
- 6.4. During in-situ management
- 6.4.1. Consider having a copy of the relevant code of practice and this guideline on hand.
 - 6.4.2. If the area borders any parks or public land, consider erecting signage for the duration of the works. For example: "Works are being conducted by [insert LGA] as authorised under the Department of Environment and Heritage Protection's Code of Practice – Ecologically sustainable management of flying-fox roosts. Please contact [insert LGA] for any further information on [phone and email]."
 - 6.4.3. Consider making all staff aware of their roles and responsibilities, including any limitations of their role (for example the role of wildlife carer may be limited to technical expertise only, or involve the caring for abandoned young if required, etc).
 - 6.4.4. Consider a 'day of works count' by a suitably qualified/skilled person, making a record for each flying-fox species present of the total number of flying-foxes, the number of pregnant females and

Flying-fox roost management guideline

the number of dependent young (see [Appendix C](#) section 1 for an example of how to record count results).

- 6.4.5. Immediately before commencing works, consider inspecting the site to ensure all flying-foxes have left.
- 6.4.6. If any works are being conducted when flying-foxes are present, consider:
 - 6.4.6.1. Clearly identifying the tree/s which are not to be affected.
 - 6.4.6.2. Using a 'spotter' to observe the activity of the flying-foxes for the purposes of ceasing work at any sign of flying-fox disturbance (i.e. if flying-foxes become agitated and/or start to lift).
 - 6.4.6.3. Minimising the use of loud machinery or equipment that produces sudden impacts or sudden loud sounds.
 - 6.4.6.4. Using any cut vegetation as mulch for the roost site.
 - 6.4.6.5. If chainsaws are needed, starting the chainsaw away from the roost and letting it run for a short time to allow flying-foxes to adjust. Then moving closer to flying-foxes and repeating.
- 6.4.7. When commencing in situ management, consider starting from the periphery where you can clearly see that a tree contains no flying-foxes. At night, this can usually be confirmed with a spotlight (check for eye-shine).

6.5. Post in-situ management

- 6.5.1. Consider completing an outcome report for future reference (see [Appendix C](#) for an example template) including a 'follow up count' by a suitably qualified/skilled person, making a record for each flying-fox species present of the total number of flying-foxes, the number of pregnant females and the number of dependent young (see [Appendix C](#) section 1 for an example of how to record count results).

N.B. EHP encourages the sharing of outcome reports with interested parties, to ensure transfer of learning's and continual improvement of management techniques.

7. Dispersal

- 7.1. Where dispersal is the chosen approach, consider the need for significant modification/destruction of roost vegetation, followed by a coordinated attempt (over a number of consecutive days) to drive flying-foxes away from the site.
- 7.2. Note requirements under the relevant code of practice, and consider having a copy of the code and this guideline on site during all works. The Code of practice – Ecologically sustainable management of flying-fox roosts is available at the following webpage <http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management.html>
- 7.3. Pre dispersal
 - 7.3.1. Consider appointing a person to coordinate the works on site each day.
 - 7.3.2. Consider creating a map of the area, centred on the roost site and including the immediate surrounds. Where possible, use cadastral boundaries, overlay with satellite imagery and identify the approximate total area of the roost.
 - 7.3.3. Consider a site visit to ground truth the mapping and to have a suitably qualified/skilled person conduct a 'planning count' at the site, making a record for each flying-fox species present of the

Flying-fox roost management guideline

total number of flying-foxes, the number of pregnant females and the number of dependent young (see [Appendix C](#) section 1 for an example of how to record count results).

- 7.3.4. Where pregnant females or dependent young are present, consider delaying works.
 - 7.3.5. Consider the number of staff and the various equipment required for each stage of works. Stage one, modification/destruction of vegetation may require a large team of people working for one night. Stage two, driving away of flying-foxes, may require a number of small teams of people, some stationed at the roost, and some mobile teams, working for an hour or two at dusk and dawn for a number of consecutive days (e.g. 5 days or more.)
 - 7.3.6. For stage one works, consider aiming to complete works well in advance of flying-foxes returning to the site.
 - 7.3.7. For stage two works, consider what equipment is required for driving flying-foxes away (for example, foggers, sound and light for each team), what equipment is required for communications between the coordinator and each team (for example, mobile phones, walkie talkies, loud hailers) and what transport is required for any mobile teams. Also, consider planning for all staff meetings immediately prior to commencement of each attempt to drive flying-foxes away.
 - 7.3.8. Consider engaging a wildlife carer, inoculated for Lyssavirus. If a wildlife carer is not engaged, it should be noted that wildlife carers (or other members of the public) are lawfully able to observe activities on, or from, public land.
 - 7.3.9. Consider if any landholder approvals may be required.
 - 7.3.10. Noting that dispersed flying-foxes may relocate into urban backyards and other undesirable locations, consider how best to alert the local community of the potential for this (for example, via the local media, letter box drops, etc.). Consider including the following in your community advice: what residents should expect to see and hear, who they should contact if they observe a sick, injured or orphaned flying fox and what action they should take if flying foxes move onto their property.
- 7.4. Dispersal stage 1: Vegetation modification/destruction
- 7.4.1. Consider having a copy of the relevant code of practice and this guideline on hand.
 - 7.4.2. If the area borders any parks or public land, consider erecting signage for the duration of the works. For example: "Works are being conducted by [insert LGA] as authorised under the Department of Environment and Heritage Protection's Code of Practice – Ecologically sustainable management of flying-fox roosts. Please contact [insert LGA] for any further information on [phone number and email]."
 - 7.4.3. Consider making all "stage 1" staff aware of their roles and responsibilities, and any limitations of their role (for example the role of wildlife carer may be limited to technical expertise only, or involve the caring for abandoned young if required, etc.).
 - 7.4.4. Consider a 'day of works count' by a suitably qualified/skilled person, making a record for each flying-fox species present of the total number of flying-foxes, the number of pregnant females and the number of dependent young (see [Appendix C](#) section 1 for an example of how to record count results).
 - 7.4.5. Immediately before commencing works, consider inspecting the site to ensure all flying-foxes have left.
 - 7.4.6. Consider commencing from the periphery of the area where you can clearly see that a tree

Flying-fox roost management guideline

contains no flying-foxes. At night, this can usually be confirmed with a spotlight (check for eye-shine).

- 7.4.7. It should be ensured that vegetation is modified sufficiently to allow for stage 2 actions to be effective.

7.5. Dispersal stage 2: Driving flying-foxes away

- 7.5.1. Note requirements under the relevant code of practice that relate specifically to driving away flying-foxes, and consider having a copy of the code of practice and this guideline on hand.
- 7.5.2. Consider having an all-staff meeting immediately prior to commencement of each attempt to drive flying-foxes away. Including: ensuring communication systems are operational, that mobile teams have appropriate transport should flying-foxes attempt to land in unsuitable locations, that all staff are aware of planned start and stop times and that works may be required to cease at other times (i.e. if flying-foxes are killed or injured), that staff are provided maps if necessary, and that staff are aware of relevant health and safety issues (including not touching flying-foxes).
- 7.5.3. Consider making all “stage 2” staff aware of their roles and responsibilities, and any limitations of their role (for example the role of wildlife carer may be limited to technical expertise only, or involve the caring for abandoned young if required, etc.).
- 7.5.4. Consider having staff on look-out immediately prior to dawn, so that driving away can commence before flying-foxes land at the site.
- 7.5.5. Staff at the roost site should be fully prepared prior to dawn, and mobile team/s on standby, to enable a coordinated response. Each team should consider using multiple non-lethal methods simultaneously (for example, foggers, sound and light).
- 7.5.6. All efforts should be made to deter flying-foxes from landing anywhere at the site. If they attempt to land at another unsuitable site, mobile teams should be deployed immediately to drive them away.
- 7.5.7. Full dispersal should not be expected on the first attempt.
- 7.5.8. Once works cease, and the remaining numbers of flying-foxes have settled, consider having a suitably qualified/skilled person survey the site and surrounding areas, and make a record for each flying-fox species of the total number of flying-foxes, where they have settled and any welfare issues.
- 7.5.9. For subsequent attempts to drive flying-foxes away, note that continual use of the same method/s may sometimes result in flying-foxes habituating to the method/s and lead to poor dispersal outcomes.
- 7.5.10. Visible signs of distress in flying-foxes may include flying low, landing on the ground or abortion of fetuses.

7.6. Post dispersal

- 7.6.1. Consider completing an outcome report for future reference (see [Appendix C](#) for an example template) including a ‘follow up count’ by a suitably qualified/skilled person, making a record for each flying-fox species present of the total number of flying-foxes, the number of pregnant females and the number of dependent young (see [Appendix C](#) section 1 for an example of how to record count results).

N.B. EHP encourages the sharing of outcome reports with interested parties, to ensure transfer of learning’s and continual improvement of management techniques.

8. Coordination and advice

8.1 Coordination

- 8.1.1. Consider appointing a person to coordinate all activities on site, for each day of activities at a roost.
- 8.1.2. Consider providing a copy of any relevant code of practice to the coordinator, and ensuring they are aware of all circumstances in which they would be required, under the code of practice, to immediately stop work.
- 8.1.3. Consider providing a copy of this guideline to the coordinator.

N.B. Coordination is a mandatory requirement for some activities. For example, driving away flying-foxes requires coordination. See the *Code of practice – Ecologically sustainable management of flying-fox roosts* for more information <http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management.html>

8.2. Advice

- 8.2.1. Consider appointing a person to advise the coordinator on matters of flying-fox behaviour and welfare.
- 8.2.2. Consider briefing the advisor of their role and responsibilities, including that they are not empowered to direct the cessation of works, but where they believe works should be ceased, are required to advise the coordinator.

N.B. Advice from a person knowledgeable about flying-fox behaviour is a mandatory requirement for some activities. For example, driving away flying-foxes requires advice from a person knowledgeable about flying-fox behaviour. See the *Code of practice – Ecologically sustainable management of flying-fox roosts* for more information <http://www.ehp.qld.gov.au/wildlife/livingwith/flyingfoxes/roost-management.html>

9. Accidents and emergency situations

- 9.1. In any situation where flying-foxes are found to be injured or killed, EHP and RSPCA Qld should be notified immediately (EHP: 1300 130 372, RSPCA Qld: 1300 264 625).
- 9.2. See the Code of practice - Care of Sick, Injured or Orphaned Protected Animals in Queensland for further information: <http://www.ehp.qld.gov.au/wildlife/caring-for-wildlife/index.html>

N.B. Euthanasia of sick, injured, abandoned or orphaned flying-foxes may only be performed by a vet, and only in certain circumstances, i.e. if the vet reasonably believes the animal (a) is sick or injured to the extent that the animal is unable or unlikely to recover from the sickness or injury; or (b) is unable or unlikely to survive in the wild because the animal is orphaned.

10. Further reading

- 10.1. For more information on the management of flying-fox camps you may wish to refer to: http://www.seqcatchments.com.au/literature_103793/Flying_Fox_Guidelines%E2%80%8E

Appendix A: Flying-fox identification and distribution maps

The little red flying-fox—

- Reddish brown to dark brown.
- Fur on neck, shoulders, around the eyes and under the wing varies from brown to yellow. The top of the head tends to be grey.
- Distinguishable from other common flying-foxes by its small size; forearm length 125–156 mm and head and body length 195–235 mm.
- There is little to no fur on the legs.
- The ears are prominent.



Figure 1. Little red flying-fox

The black flying-fox—

- Short black fur with a slight silver frosting in older individuals.
- Brown rings around the eyes are found on some individuals which usually have dark grey-brown to light yellow hind neck and shoulder fur.
- There is no fur on the lower leg of this species.
- Largest of the Australian flying-foxes with a forearm length of 150–191 mm and a head and body length of 240–280 mm.

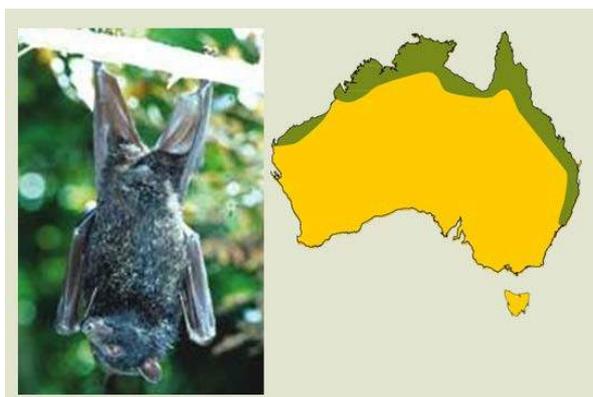


Figure 2. Black flying-fox

The grey-headed flying-fox—

- Head and body covered in thick grey fur, with a reddish-yellow collar completely encircling the neck.
- Fur extends to the ankle.
- Large species with a forearm length of 138–180 mm and a head and body length of 230–289 mm.



Figure 3. Grey-headed flying-fox

The spectacled flying-fox—

- Almost black with prominent yellow neck ruff and prominent straw-coloured fur surrounding the eyes and along the muzzle. The ruff and head is silver-blond in some individuals.
- Yellow rings (spectacles) around the eyes.
- There is no fur on the lower leg of this species.
- Size of forearm is 160–189 mm and head and body length is 220–240 mm.

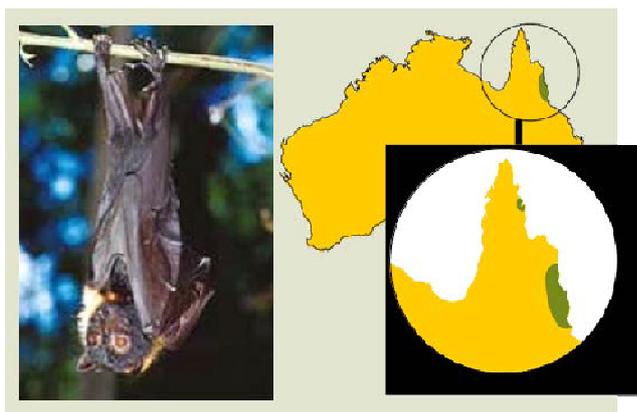


Figure 4. Spectacled flying-fox

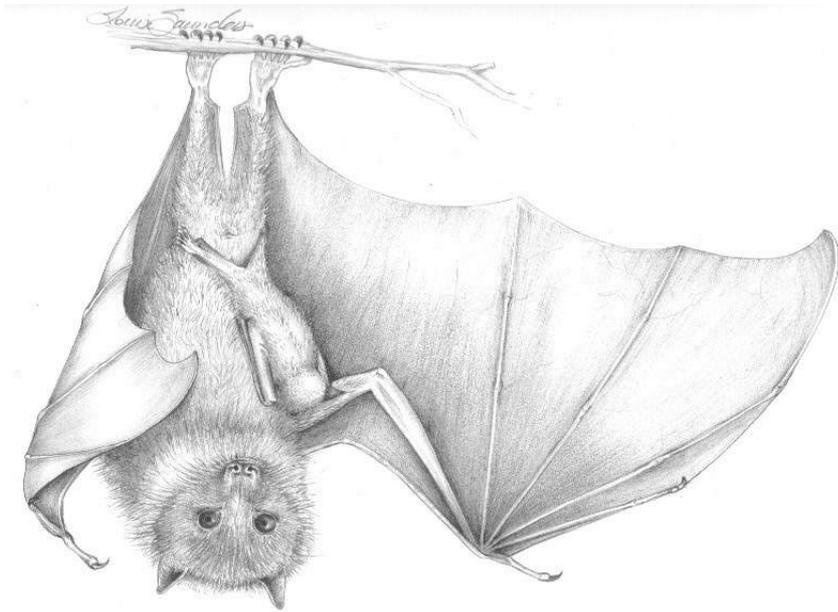


Figure 5. Flying-fox showing young in armpit. (Copyright Louise Saunders.)

Appendix B: Monitoring report

Section 1.

Grey-Headed			Spectacled			Little red			Black		
Total	Pregnant	Dependent	Total	Pregnant	Dependent	Total	Pregnant	Dependent	Total	Pregnant	Dependent
1st quarter count. Conducted by:						Date:					
2nd quarter count. Conducted by:						Date:					
3rd quarter count. Conducted by:						Date:					
4th quarter count. Conducted by:						Date:					

Section 2: Comments

1st quarter:

2nd quarter:

3rd quarter:

4th Quarter:

Appendix C: Outcome report

Type of management action: In-situ management Dispersal

Coordinating officer on site

Date of management action

Section 1.

Grey-Headed			Spectacled			Little red			Black		
Total	Pregnant	Dependent	Total	Pregnant	Dependent	Total	Pregnant	Dependent	Total	Pregnant	Dependent
Planning count.			Conducted by:			Date:					
Day of works count.			Conducted by:			Date:					
Follow up count.			Conducted by:			Date:					

Section 2.

Were there any issues in the planning or implementation of the management action? If so, how were these resolved?

Do you have any recommendations for future management actions?

Report completed by

Douglas Shire Council Flying Fox Assessment Matrix

	1	2	3	4	5	Score
No: of Bats	<100	100-250	250-500	500-1000	>1000	4
Dist from houses	>100m	75-100m	50-75m	25-50m	<25m	3
No: of houses impacted	1-5	5-10	10-15	15-20	>20	4
No Residents impacted	1-5	5-10	10-15	15-20	>20	5
Setting	Natural area	Low Density Residential/industrial	Medium Density Residential/industrial	Medium-High Density Residential/industrial	High Density Residential/industrial	3
Noise	Very little noise, occasional	Some noise, intermittent	noticeable, intermittent	Loud, for long periods	Very loud, continuous	4
Smell	Weak, occasional	Weak/medium	Medium	Medium/Strong	Very strong continuous	3
Mess	0-10% coverage	10-20%	20-30%	30-50%	>50% coverage	4
Health	Low risk	Low/Med	Medium	Med/High	Very high risk	2
Impact on Assets	Low	Low/Med	Medium	Med/High	Very High	4
Achievability	Low	Low/Med	Medium	Med/High	High	3
Cost of Action	High	Low/Med	Medium	Med/Low	Low	3
					Total	42/60



Douglas Shire Council Flying Fox Assessment Matrix

Score	Response	Actions
5-20	No immediate action required	Provide information & Education, Community liaison,
20-35	Monitor frequently	Provide information & Education, Community liaison, Individual resident liaison, Investigate possible operational works if conditions change
35-60	Intervention required	Formulate action plan, scope resources, Government Agency liaison, Operational works

Attribute	Assessment Criteria
Number of Bats	Influences the potential impacts - high numbers increase the impacts of all attributes
Distance from houses	Influences the potential impacts – closer to houses/buildings the greater impact of noise, smell, health and Impact on assets
Number of houses impacted	How many houses are impacted - one or two house in a semi remote or quite residential area to high density housing estates
Number Residents impacted	Relative to number of houses impacted unless block of units.
Setting	Is the roost occupying a natural habitat and this is where you expect bats to roost. Are the bats in a residential area? Is it near a school, hospital or childcare, old age housing, airport?
Noise	Is the noise only for a little while eg early morning/late evening; quite or loud can use decibel readings – Environmental health standards
Smell	How strong is the smell and how often can it be smelt
Mess	Quantify the coverage of bat droppings on footpaths, and other park infrastructure using a percentage and or damage to assets
Health	What are the main concerns? Is it a general perception issue or legitimate health concern? QLD Health or other health professional to advise.
Impact on Assets	Quantify the coverage of bat droppings on footpaths, and other park infrastructure using a percentage and or damage to assets
Achievability	Will dispersal work and not just shift the problem somewhere else eg –Riparian zone – will the bats simply move a few hundred metres. How long has the roost been occupied – the longer the occupation the harder to disperse.
Costs	Each intervention has a cost ranging from relative low costs but resource demanding passive actions eg smoke, lights to extremely high costs associated with habitat modification