



Attachments

Planning and Strategy Committee

Notice is hereby given that an Planning and Strategy Committee of Council will be held at Council Chambers, 1 Belgrave Street, Manly, on:

Monday 4 May 2015

Commencing at 7.30pm for the purpose of considering items included on the Agenda.

Persons in the gallery are advised that the proceedings of the meeting are being taped. However, under the Local Government Act 1993, no other tape recording is permitted without the authority of the Council or Committee. Tape recording includes a video camera and any electronic device capable of recording speech.

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TABLE OF CONTENTS

Item	Page No.
------	----------

ENVIRONMENTAL SERVICES DIVISION**Environmental Services Division Report No. 17**

Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

AT1: Balgowlah Grey-headed Flying-fox Camp Management Plan	2
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Environmental Services Division Report No. 18Proposed Adoption of Amendment No. 5 to Manly Development Control Plan 2013
Regarding Miscellaneous Amendments – Post Exhibition

AT1: Proposed Amendment No.5 to Manly DCP 2013	40
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******* END OF ATTACHMENTS *******

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan



Balgowlah Grey-headed Flying-fox Camp Management Plan

Prepared for
Manly Council

20 March 2015



ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

DOCUMENT TRACKING

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Contents

Executive summary	vi
1 Introduction	1
1.1 Overview	1
1.2 Need for the plan	2
1.3 Objectives	2
2 Context	5
2.1 Regional context	5
2.2 History of the camp	6
2.2.1 Vegetation	6
2.2.2 Access	7
3 Management issues	14
3.1 The subject site	14
3.1.1 Proposed and existing infrastructure	14
3.1.2 Weed infestation and habitat loss	15
3.1.3 Heat stress	15
3.1.4 Displacement of native fauna	16
3.2 Off-site GHFF management issues	16
3.2.1 Electrocutation or entanglement	16
3.2.2 Faecal drop	16
3.2.3 Noise	17
3.2.4 Odour	17
3.3 Human health risks from pathogens, viruses and diseases	17
4 Management actions	18
4.1 Construction and maintenance of infrastructure	18
4.2 Management of injured or dead flying-foxes	20
4.3 Community education and concerns	21
4.4 Population monitoring	21
4.5 Vegetation management	22
4.6 Heat stress management	23
4.7 Street trees and parks	23
5 Implementation	24
5.1 Responsibilities	24
5.2 On-ground works	24
5.3 Licences and approvals	24

**Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan**

References	26
Appendix A Count data by RBGDT.....	28
Appendix B Human health and GHFF	30

List of figures

Figure 1: Mown grassed buffer between units and bushland	1
Figure 2: Balgowlah GHFF camp (roosting areas will be subject to seasonal fluctuations)	3
Figure 3: GHFF camps in the Sydney metropolitan area.....	4
Figure 4: Potential GHFF habitat.....	8
Figure 5: 1943 aerial photograph	9
Figure 6: 2002 aerial photograph	10
Figure 7: Features of the subject site	11
Figure 8: Treated and untreated vegetation	12
Figure 9: Cover of Gross Pollutant Trap	12
Figure 10: Weed infested site of proposed constructed wetland and rain garden	13
Figure 11: Public activities within the subject site	14
Figure 12: Vines threatening GHFF habitat	15
Figure 13: Brush turkey and Water Dragon	16
Figure 14: Revegetation with canopy tree species that will eventually provide GHFF roost habitat	22

List of tables

Table 1: Key structural flora	7
Table 2: GHFF life cycle to assist with scheduling construction and maintenance works	19
Table 3: Restrictions on construction and maintenance	20

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Abbreviations

Abbreviation	Description
DOE	Commonwealth Department of the Environment
ELA	Eco Logical Australia
EPBC	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
GHFF	Grey-headed Flying-fox
GPT	Gross Pollutant Trap
LGA	Local Government Area
NPW	NSW <i>National Parks and Wildlife Act 1974</i>
OEH	NSW Office of Environment and Heritage
PoM	Plan of Management
RBGDT	Royal Botanical Gardens and Domain Trust
TSC	NSW <i>Threatened Species Conservation Act 1995</i>
WONS	Weeds of National Significance

Executive summary

In 2010, a colony of Grey-headed Flying-fox (GHFF) (*Pteropus poliocephalus*) established in urban bushland at Burnt Bridge Creek, Balgowlah. Regular monitoring by the Royal Botanic Gardens and Domain Trust determined that numbers of GHFF at the camp have increased in recent years, reaching about 5,900 individuals in June 2014. The Black Flying-fox (*P. alecto*) and one Little Red Flying-fox (*P. scapulatus*) have also been recorded at the Balgowlah camp.

All flying-fox species are protected under the *National Parks and Wildlife Act 1974* (NPW Act). The GHFF is also listed as vulnerable to extinction under the *NSW Threatened Species Conservation Act 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Manly Council is responsible for managing the Balgowlah GHFF camp. In accordance with NSW and Commonwealth Government legislative and policy requirements, Council needs to protect the species and minimise conflicts between the GHFF and residents in the area. To date, there have been about 20 complaints from residents in Manly LGA regarding flying-foxes, primarily about noise at night as the GHFF forage in trees.

Key actions to be taken by Council are as follows:

- Protect and manage the GHFF colony in situ.
- Obtain a five-year s91 licence from OEH to cover routine maintenance activities such as mowing, bush regeneration and GPT maintenance. In discussions with OEH regarding the licence, Council should indicate that they propose to construct a basin adjacent to core roosting habitat in accordance with the restrictions set out in the plan e.g. restricted time frames and wildlife carer present during works.
- Obtain a s132C licence for bush regeneration activities at the site.
- Educate the community (e.g. using signage) about the importance of GHFF and what to do if they find a dead or injured flying-fox.
- Support ongoing monitoring of the GHFF population by RBGDT, and respond promptly to issues raised by survey data and the community.

1 Introduction

1.1 Overview

This plan has been commissioned by Manly Council to guide management of the Grey-headed Flying-fox (GHFF) camp at Burnt Bridge Creek, Balgowlah, over the next ten years. The plan also provides a framework for Council and others to manage flying-foxes more generally throughout the Manly Local Government Area (LGA).

As shown in **Figure 2**, the Burnt Bridge Creek subject site is located in urban bushland between Balgowlah Road and the Burnt Bridge Creek Deviation. The site comprises about 0.7 ha of core roosting habitat for flying-foxes and 1.6 ha of potential roosting habitat, although the area of roosting habitat varies seasonally. As illustrated below, a 10 m mown grassed buffer separates a block of residential units from bushland at the eastern end of the site. Other residences in close proximity to the camp are on the southern side of Balgowlah Road.

The site is Crown land managed by Manly Council and zoned *RE1 Public Recreation* under the Manly Local Environment Plan (LEP) 2013.



Figure 1: Mown grassed buffer between units and bushland

There have been approximately 20 complaints from residents in the Manly LGA over the last few years regarding conflicts with GHFF. These complaints generally relate to matters such as noise and faecal drop as the GHFF move around Manly LGA to forage at night. There have been some complaints from residents living near the camp.

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

1.2 Need for the plan

Manly Council is responsible for managing the Burnt Bridge Creek flying-fox camp in accordance with legislative and policy requirements. The camp is predominantly occupied by GHFF (*Pteropus poliocephalus*) which is protected under the *National Parks and Wildlife Act 1974* (NPW Act), and listed as vulnerable to extinction under the *NSW Threatened Species Conservation Act 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Further management requirements are set out in the *Draft EPBC Act Policy Statement - Camp Management Guidelines for the Grey-headed and Spectacled flying fox* (Department of Environment 2014) and *Draft Flying-fox Camp Management Policy* (OEH 2014).

Other species that have been recorded roosting in the camp include the Black Flying-fox (*P. alecto*) and Little Red Flying-fox (*P. scapulatus*) (pers com John Martin, RBGDT March 2015). These species are protected under the NPW Act.

As depicted in **Figure 3**, the Balgowlah camp is an integral component within the network of camps across eastern Australia and provides a staging platform for migrating GHFFs. Flying-foxes are highly mobile and can travel large distances during the nightly and seasonal foraging forays. They have an important role in pollination and seed dispersal for many plants.

There is a need to manage the Balgowlah site so that the habitat continues to support GHFFs in the long term. This includes careful management of bush regeneration activities and construction / maintenance of infrastructure within the subject site. Management of the camp also needs to ensure that risks and impacts to surrounding neighbourhoods are minimal.

This plan is also needed to help manage the risk of significant numbers of GHFF being relocated to the Manly LGA from camps being dispersed elsewhere in the Sydney metropolitan area.

1.3 Objectives

In 2014, OEH released the *Draft Flying-fox Camp Management Policy*, which includes the following objectives for flying-fox camp management:

- address the potential impacts of flying fox camps on human health
- minimise the impact of camps on local communities
- provide a balance between conservation of flying-foxes and their impacts on human settlements
- clarify roles and responsibilities for OEH, local councils and other land managers such as managers of Crown Lands
- provide options for land managers to obtain upfront five year licensing to improve flexibility in the management of flying-foxes
- enable land managers and other stakeholders to use a range of suitable management responses to sustainably manage flying-foxes
- require land managers to consider the behaviours, habitat and food requirements of flying-foxes when developing and implementing camp management plans
- enable long term conservation of flying-foxes in appropriate locations by encouraging land managers to establish and protect sufficient food supplies and roosting habitat.

The focus this plan is consistent with the policy objectives to minimise conflict between the camp and surrounding community, and provide the framework for Council to manage activities within the subject site itself, particularly routine maintenance works and construction of stormwater pollution controls.



ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

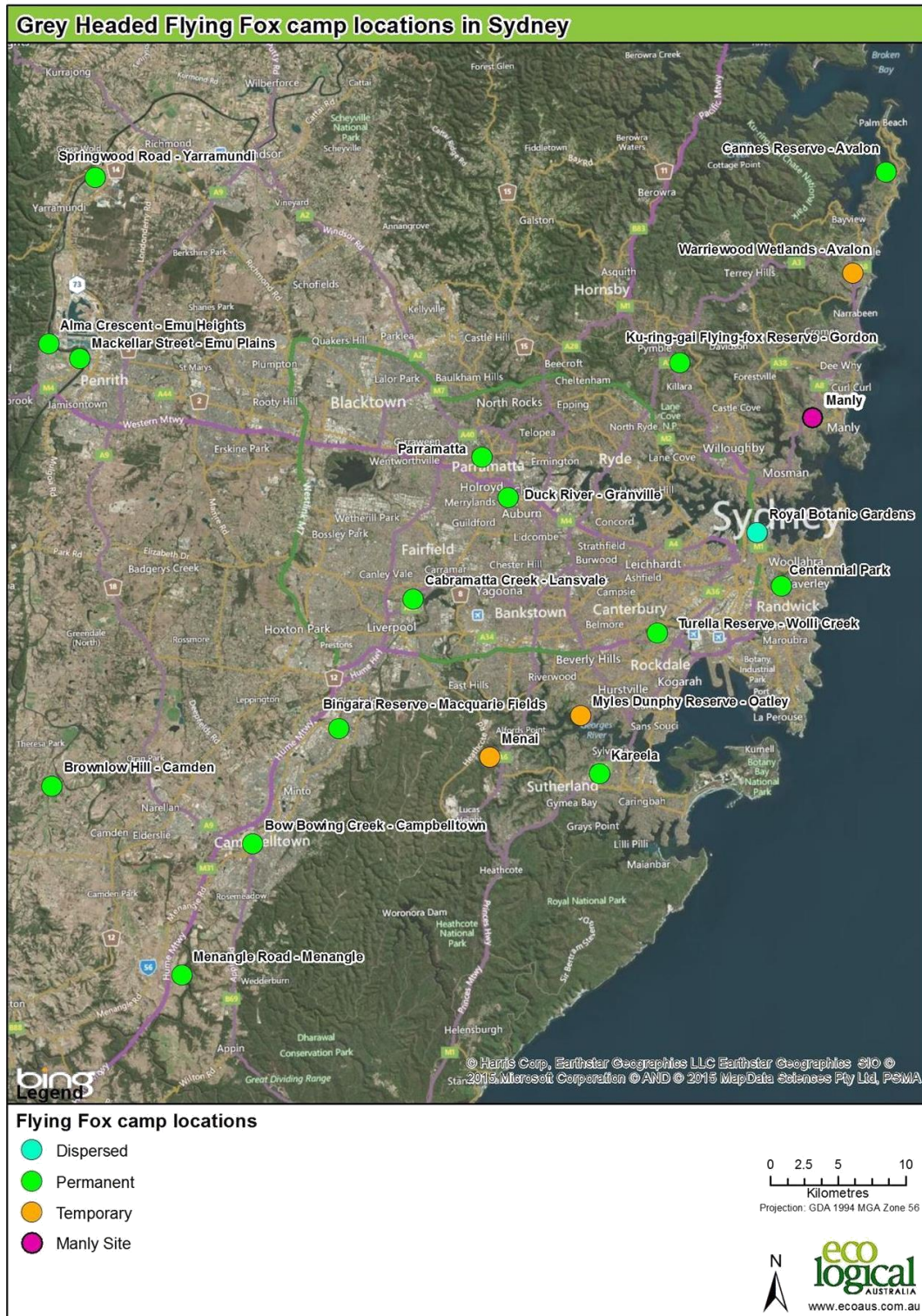


Figure 3: GHFF camps in the Sydney metropolitan area

2 Context

This chapter provides background information on the Burnt Bridge Creek camp and the issues to be addressed.

2.1 Regional context

Figure 3 depicts the location of the Balgowlah GHFF camp in relation to other camps in the Sydney metropolitan region. The Royal Botanic Gardens camp was dispersed in 2012/13 and numbers of GHFF recorded at other camps in the region have subsequently increased. There are plans for further dispersal of GHFF from other camps with high levels of conflict with neighbours e.g. Cannes Reserve, Pittwater. This has potential implications for the Balgowlah camp.

Figure 4 illustrates potential roosting habitat for GHFF in the region. It is acknowledged that this type of assessment is generally associated with flying-fox camp dispersal management plans (e.g. ARCUE 2009; ECOSURE 2014). However, there are no plans to disperse the Burnt Bridge Creek camp. This information has been provided to Manly Council due to the impending dispersal of other Sydney GHFF camps and because of the uncertainty associated with where the displaced bats will relocate to.

To undertake this assessment, criteria presented in ARCUE (2009) were applied to predict the probable locations in which flying-foxes might be expected to establish a camp. The areas are **suitable** roost habitat according to the following criteria based on previous knowledge of the species:

- patch size to allow for seasonal influxes of flying-foxes and greater than 1 ha
- vegetation type containing vegetation in excess of 3 m in height with dense foliage
- proximity to aquatic habitat (creeks, swamps)
- historically been used by flying-foxes.

Appropriate roosts locations are considered areas that satisfy the following criteria:

- unlikely to negatively impact upon any other threatened flora or fauna species or ecological communities
- there is a minimum 300 m buffer separating the camp from residential dwellings or industry
- the neighbouring landowners or managers are accepting of occupancy within their land or neighbouring areas
- there is sufficient habitat to provide suitable roosting habitat for between 5000 and 12000 individuals
- there is an area large enough and contains enough vegetation that will survive the destructive nature of permanent flying-fox occupation. Ideally the site will be of sufficient size and contain enough vegetation to allow the camp to occupy no more than one third of the available roost habitat at any given time (DECC 2007), this will allow the camp to shift and occupy other areas in response to the usual canopy degradation associated with flying-fox camps.

Areas mapped as suitable habitat that do not fit this criterion are considered '**inappropriate**' (**Figure 4**).

The Council or agency responsible for dispersing a GHFF camp is responsible for managing relocation to appropriate locations.

**Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan**

2.2 History of the camp

Burnt Bridge Creek is a 3 km freshwater creek that drains to Manly Lagoon through an urbanised catchment. A comparison of aerial photographs taken in 1943 (**Figure 5**), 2002 (**Figure 6**) and current (**Figure 2**) indicates changes to vegetation and the urban infrastructure in the area.

GHFF were first recorded at the subject site during radio and satellite tracking by Peggy Eby in 2010 (pers com John Martin, RBGDT March 2015). However, GHFF may have roosted at the site previously when conditions were suitable. Monthly count data provided by the RBGDT is provided in **Appendix A**. The data indicate that the camp has been permanently occupied since December 2012, which coincides with when the Royal Botanic Gardens camp was dispersed. Numbers in the camp fluctuate with seasonal conditions and have peaked at about 5,900 in June 2014.

In 1996, Council prepared a Plan of Management (PoM) for Community Lands along Burnt Bridge Creek. The PoM appears to pre-date establishment of the GHFF camp because the camp is not mentioned in the plan. However, the PoM states that native habitats should be conserved and/or recreated where possible.

Over the past ten years Manly Council has applied funds from Council's Environment Levy to the Burnt Bridge Creek catchment to:

- revegetate
- control weeds
- educate residents to influence behaviour on environmental issues (e.g. to stop garden waste being dumped in bushland)
- sweep streets to remove pollutants
- install interpretive signage
- upgrade the walking/cycle path.

The Burnt Bridge Creek Integrated Restoration Project was initiated by Manly and Warringah Councils with funding from the NSW Environmental Trust. The project is in the process of being implemented and features:

- stormwater harvesting and quality treatment – this includes a GPT which was constructed in 2009 (location of the GPT is indicated in **Figure 7** and **Figure 9**)
- establishment of a sediment basin - proposed location for the constructed wetland / rain garden is identified in **Figure 7** and **Figure 10**
- removal of aquatic and riparian weeds and bush regeneration (**Figure 8** shows the regenerated area on the right of the sediment fence, and the untreated area on the left)
- creek bank restoration
- catchment wide community education.

2.2.1 Vegetation

Vegetation within the subject site is mapped as Dry Sclerophyll Forest. Field investigation found that a substantial proportion of has been subject to bush regeneration or invaded by exotic species. There are no endangered ecological communities on site. Exotic vines and Weeds of National Significance (WONS) are adversely impacting the GHFF roosting habitat as well as broadly ecology and amenity.

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Table 1: Key structural flora

Species Name	Common Name	Origin
<i>Acacia floribunda</i>	White Sally	Native
<i>Angophora costata</i>	Smooth Barked Apple	Native
<i>Banksia integrifolia</i>	Coast Banksia, Old Man Banksia	Native
<i>Banksia marginata</i>	Silver Banksia	Native
<i>Bidens pilosa</i>	Cobbler Pegs	Exotic
<i>casuarins glauca</i>	Swamp She-oak	Native
<i>Dichondria repens</i>		Native
<i>Dodonaea triquetra</i>	Common Hop-bush	Native
<i>Erythrina sp.</i>	Coral Tree	Exotic
<i>Glochidion ferdinandi</i>	Cheese Tree	Native
<i>Hedychium gardnerianum</i>	Ginger Weed	Exotic
<i>Ipomoea purpurea</i>	Purple Morning Glory	Exotic*
<i>Lomandra longifolia</i>		Native
<i>Ligustrum sinense</i>	Large – leaf Privet	Exotic*
<i>Nerium oleander</i>	Oleander	Exotic
<i>Persicaria sp.</i>	Knotweed	Native
<i>Solanales sp</i>	Deadly Night Shade	Exotic
<i>Tradescantia fluminensis</i>	Wandering Trad	Exotic
Unknown	Tree Ferns	Native

* *Ligustrum sinense* and *Ipomoea purpurea* are listed as Control Class 4 under the *Noxious Weeds Act 1993*: The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority and the plant may not be sold, propagated or knowingly distributed.

2.2.2 Access

There is unrestricted public access through the subject site. The site features a sealed cycleway / pedestrian path (**Figure 7**). Direct vehicle access to the GPT and proposed sediment basin is from the adjacent Balgowlah Road.

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

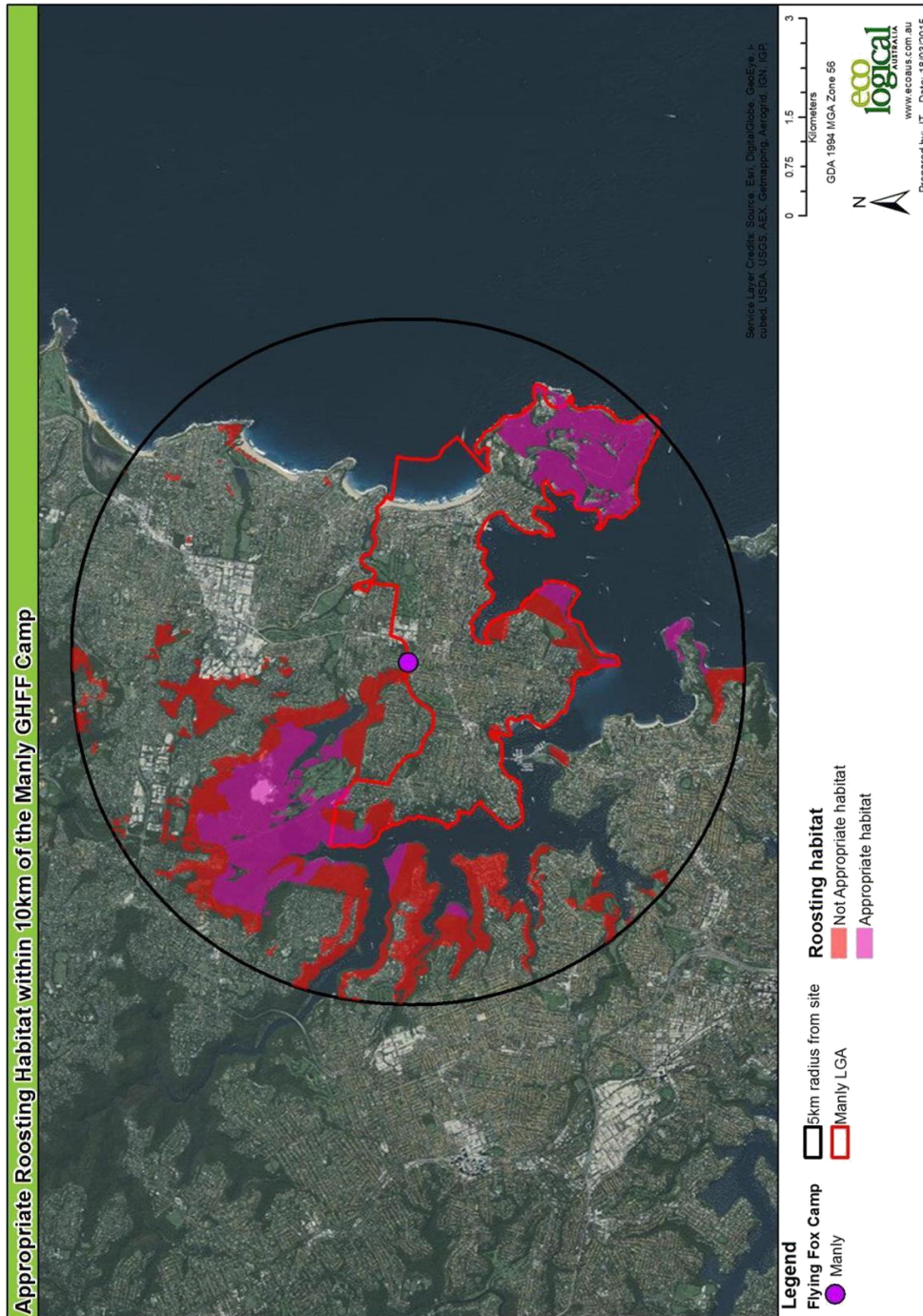


Figure 4: Potential GHFF habitat

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Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan



Figure 5: 1943 aerial photograph

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

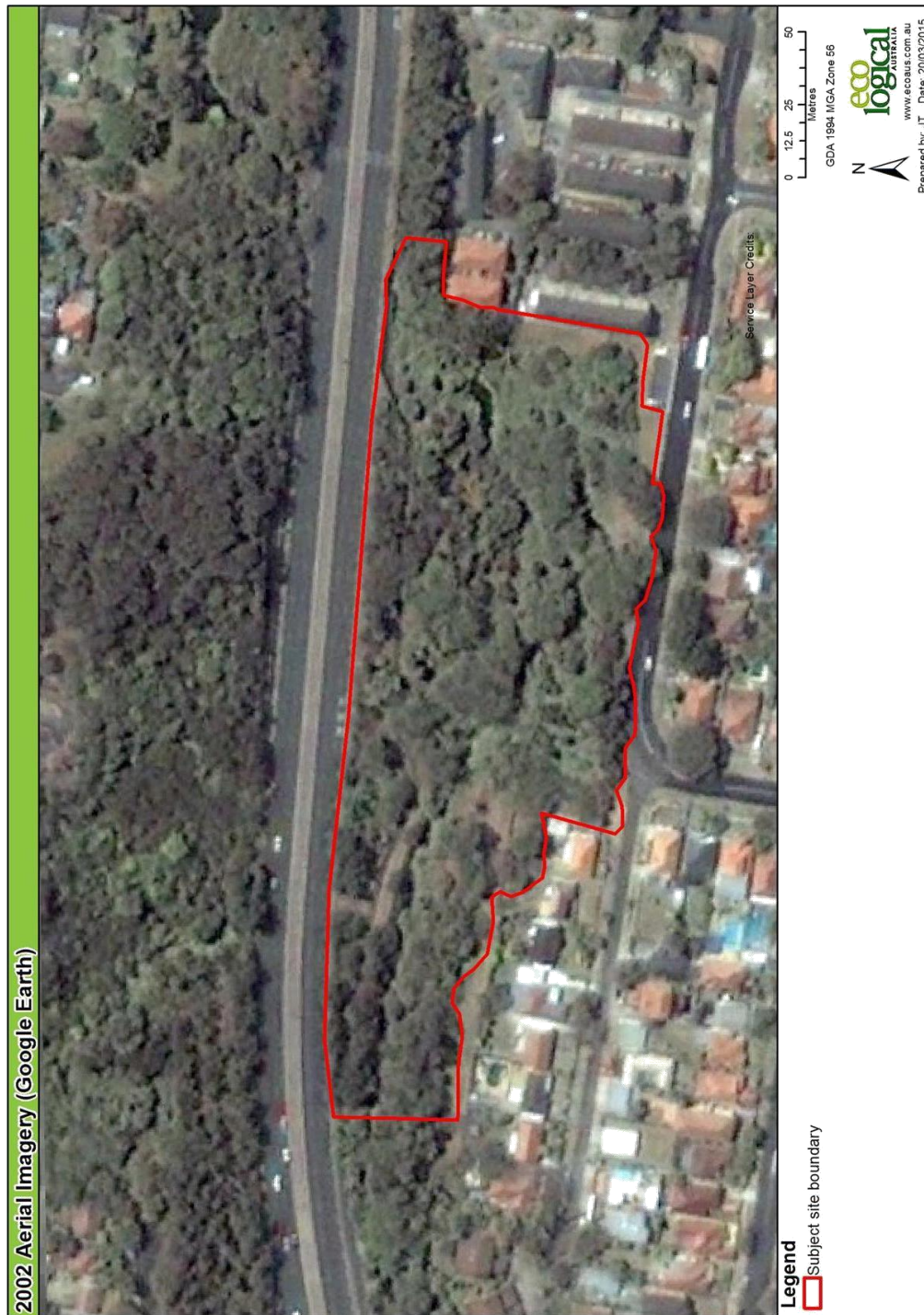


Figure 6: 2002 aerial photograph

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan



Figure 7: Features of the subject site

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Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan



Figure 8: Treated and untreated vegetation



Figure 9: Cover of Gross Pollutant Trap

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan



Figure 10: Weed infested site of proposed constructed wetland and rain garden

3 Management issues

This chapter identifies issues relevant to the GHFF that require management within the subject site and more broadly across the LGA.

3.1 The subject site

3.1.1 Proposed and existing infrastructure

Maintenance activities by Council at the subject site that could affect the flying-foxes include weed control and planting, particularly in core roosting habitat; mowing grass in buffer zones and around the GPT; rubbish removal throughout the site; and cleaning the GPT. Noise associated with these activities is generally short duration. (For example, a truck is used to vacuum clean the GPT at least once every two months. This process takes less than an hour.)

Construction of an ephemeral wetland / raingarden will involve:

- earthworks using trucks, excavators and rollers
- rock delivery and placement to create the embankments
- revegetation of the edges, drains and other areas disturbed during the work.

There will be other noise associated with unrestricted public access within the site. Examples of this include use of the path and other activities within the bushland (e.g. Error! Reference source not found.).

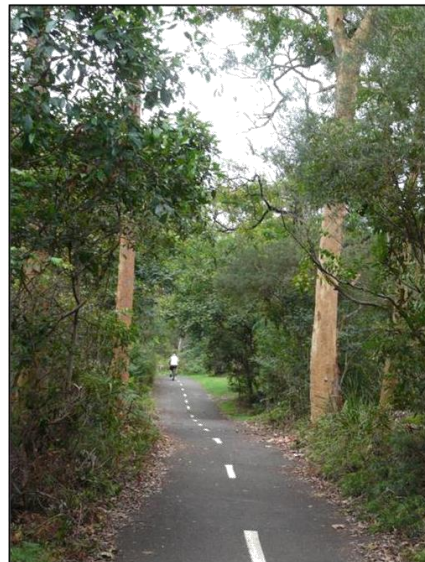


Figure 11: Public activities within the subject site

**Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan**

3.1.2 Weed infestation and habitat loss

Flying-foxes will often defoliate and break branches while landing and flying within their roosts. Tree deaths are common in densely populated camps or during prolonged periods of camp occupation. The loss of canopy, combined with increased levels of sunlight reaching the lower vegetation strata and increased nutrient loadings leads to a proliferation of weeds.

A camp will be sustainable if there is sufficient habitat for the GHFF to shift into new roost trees and allow old roosts to recover or revegetate. The Burnt Bridge Creek camp has bushland adjacent to the core roosting habitat, which provides scope for the roosting area to shift. However, weedy vines growing into the canopy can result in loss of existing and potential GHFF habitat (**Figure 12**).

Further habitat loss can be caused by rubbish dumping or vandalism, or to create wider buffers between the camp and adjacent properties.



Figure 12: Vines threatening GHFF habitat

3.1.3 Heat stress

Heatwaves over 40°C can harm or kill GHFF. Contributing factors that might increase / decrease the impacts of heat stress include:

- access to or absence of adequate understorey vegetation – dense understorey vegetation provides a refuge to escape intense heat
- timing and age of GHFFs in the camp – during the birthing season or presence of juveniles in camp (juveniles are most susceptible to heat stress events)
- the numbers of GHFF in camp (more bats will lead to competition for cool roost locations and potentially more deaths)

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

- condition of GHFFs in camp – if they are already under stress from other factors (noise, low food resources, disease or a combination of these things), they will be more prone to heat stress events.

3.1.4 Displacement of native fauna

Damage and weed invasion associated with GHFF camps can displace other native species. However, it is more likely that numbers and diversity of native species are reduced at the Burnt Bridge Creek camp because of past habitat clearing, and predation and competition from domestic and feral animals (e.g. cats and foxes). Native fauna species observed at the site include *Alectura lathamii* (Brush Turkey), *Intellagama lesueurii* (Water Monitor Dragon) and *Dacelo novaeguineae* (Laughing Kookaburra).



Figure 13: Brush turkey and Water Dragon

3.2 Off-site GHFF management issues

3.2.1 Electrocutation or entanglement

GHFF can be injured or killed when they become entangled in fruit tree netting. Similarly, flying-foxes can be electrocuted by power lines.

3.2.2 Faecal drop

Flying-foxes have a very efficient digestive system which allows food to pass through very quickly (12-30 minutes) and consequently they will primarily defecate at their feed sites or as they travel back to their roost sites (Westcott et al. 2011). However, flying-foxes are also known to defecate immediately as they leave their roosts to fly to their nightly foraging habitats. If deposited in flight, faecal matter and urine can splatter and create mess, damage property as well as cause other inconveniences such as not being able to dry washing on warm nights (Hall and Richards 2000). Flying-fox droppings can permanently mark painted objects such as cars, houses and pathways (Hall and Richards 2000, ELA 2012).

All animal faeces and urine can contain bacteria, viruses and other microorganisms that can cause illness among humans (Geolink 2012). However, NSW Health (2009) and the Department of Sustainability and Environment (DSE 2009) advise that touching and/or coming in contact with flying-fox faecal matter or urine will not transmit ABLV, Hendra or any other pathogen that is currently known to cause significant disease among humans (Geolink 2011).

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan

3.2.3 Noise

Dogs, birds of prey, planes, machinery and people can disturb roosting GHFF (Roberts 2006). If sufficiently disturbed, GHFF have been known to relocate to a different camp site. However, roosting GHFF can also become resilient to background noise e.g. GHFF at the Royal Botanic Gardens required very loud 'industrial' noise to disperse the camp. The Burnt Bridge Creek GHFF appear to be accustomed to background traffic noise, and have stayed at the site despite regular maintenance of the Council's GPT directly near core roosting habitat.

The noise created from flying-fox camps, especially during peak periods of activity, such as fly-outs and as foraging individuals return to the camp in the early morning can adversely affect human sleep patterns, create annoyance, cause stress and impact on the wellbeing of local residents (Roberts 2006, ELA 2012, Geolink 2013).

3.2.4 Odour

Flying-foxes use odour for identification, including attractants during the reproductive period to enable mothers to find their young when they return to the camp following their nightly foraging activities (Ipswich City Council - Living with Flying-foxes: Fact Sheet 4). The characteristic pungent odour emitted from flying-fox camps is a scent produced by a male scapular gland applied to tree branches to mark territories and attract females (Roberts 2006, Geolink 2011). Odour does not come from a build-up of faecal matter and urine underneath the roosting flying-foxes. The odour emitted from camps is noticeably stronger and generally regarded as being more unpleasant during:

- periods of prolonged rainfall, which causes the males to have to remark their territories
- periods of hot and humid weather conditions
- periods when the camp is densely populated by flying-foxes.

3.3 Human health risks from pathogens, viruses and diseases

Australian flying-foxes have potential to carry a number of viruses that can pose human health risks and if contracted can be fatal without the appropriate treatment (NSW Health 2012). This includes the ABLV, Hendra virus and Menangle virus (Field 2005, NSW Health 2012).

A fact sheet produced by NSW Health (2012) suggests that the occurrence and risk of transmission of these agents are very rare and the public health risk is negligible. Often these pathogens are only transmitted to humans via a third party (e.g. pigs and horses) or through directly handling or contact between an infected flying-fox and a human (DAFF 2007). Further information is provided in **Appendix B**.

The risk to human health from GHFF at the Burnt Bridge Creek camp is extremely low. However, it is important that people visiting the site (e.g. to do bush regeneration) and the broader public, are aware of the risks and what they should do if they encounter a dead or injured flying-fox. Signage can assist with this.

4 Management actions

This chapter identifies actions to be taken to assist with protection of the GHFF and its habitat at Burnt Bridge Creek, as well as across the Manly LGA. The proposed actions are designed to benefit GHFF and improve community awareness so that the risk of conflicts is minimal. The actions for Burnt Bridge Creek are consistent with Level 1 – Routine Camp Management Actions, as defined by OEH. There are no plans to disperse the camp and no significant impacts are anticipated.

With the exception of basin construction, the routine maintenance tasks have been performed at the site previously with no significant impact on the colony or individual GHFF. However, Council staff have noticed that some GHFF become unsettled during loud noise (e.g. cleaning the GPT) or when people are walking within core habitat areas. If the GHFF take flight during the day when they become unsettled, this can increase their vulnerability to birds of prey.

Where possible, the actions below are presented so that they are specific but not prescriptive, to allow flexibility with implementation as circumstances change. Performance targets are included where relevant.

4.1 Construction and maintenance of infrastructure

Actions:

Specifications for construction and maintenance of infrastructure need to include:

- restrictions to protect GHFF during sensitive periods as outlined in **Table 2** and **Table 3**, plus avoid dawn and dusk
- use of hand tools rather than noisy machinery, particularly during sensitive times in the breeding cycle
- requirements for work to be performed in the minimum duration possible
- design modifications to reduce the need for noisy machinery on site
- presence of wildlife carer during construction works to identify if the GHFF become stressed and a stop work order is needed
- contact details for a wildlife carer (see **Section 4.2**).

Performance targets:

- No dead or injured GHFF as a result of works
- Camp not split or dispersed

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Table 2: GHFF life cycle to assist with scheduling construction and maintenance works

Season	Month	GHFF activities and camp dynamics	Potential Impacts
Summer	January	Lead up to post natal juvenile dispersal. Juvenile GHFFs are becoming independent. Some individuals may leave maternal camps and migrate elsewhere, whilst others will remain in maternal camp. Numbers of GHFFs in Sydney camps are likely to be at their highest.	Even at this stage some juveniles could have restricted flight capabilities and/or in the process of establishing territories in their maternal camps. Juvenile GHFF are still prone to stress and falling to the ground where they are at risk of starvation and predation.
	February	Lead phase to the reproductive period. Males begin forming territories before the mating period begins	Disruption to normal reproductive / camp activities
Autumn	March	Creation, maintenance of male territories, mating and conception	There might be some short term disruption to normal camp dynamics. These are unlikely to cause a significant impact.
	April		
	May	Gestation / pregnancy extends across a 6 month period (includes March – August).	There might be some short term disruption to normal camp dynamics. These are unlikely to cause a significant impact.
Winter	June	Heavily pregnant females will be present in camp in August and into September	
	July	Some individuals become nomadic and move between camps. The level of movement depends on the location and level of productivity of localised winter food resources. Because of this reason, the Sydney GHFF camp numbers are usually at their lowest.	
	August		Stressed adult females could abort young
Spring	September	Birth and lactation Births and dependant young are carried by mothers during foraging movements for at least three weeks	Stressed adult females could abort or abandon young. When not attached to mother, stressed young are at risk of falling to ground where they become vulnerable to starvation and predation.
	October		
	November	Final stages of lactation and care for young Dependant young remain at camp while parents leave to forage. Parents return.	The juveniles are easily stressed and can fall to the ground where they become vulnerable to starvation and predation.
Summer	December	Final stages of care before young become independent Dependant young remain at camp while parents leave to forage. Parents return.	Dependant juvenile GHFFs continue to roost in the camp. The juveniles are easily stressed and can fall to the ground where they become vulnerable to starvation and predation.

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Table 3: Restrictions on construction and maintenance

Month	Habitat type*		
	Core	Potential	Other
January	No mechanical works, Supervising ecologist required		
February			
March	No mechanical works, Supervising ecologist required	-	-
April		-	-
May		-	-
June		-	-
July		-	-
August		-	-
September	No works allowed	No mechanical works, Supervising ecologist required	
October			
November	No mechanical works, Supervising ecologist required		
December			

*Refer to **Figure 7** for indicative habitat areas. The extent of core, potential and other habitats will need to be confirmed by observation of GHFF at the time of on-ground works.

4.2 Management of injured or dead flying-foxes

If a sick, dead or injured GHFF is found it should be reported to Council's environmental staff, Australian Wildlife Rescue Organisation or WIRES (1300 094 737). Staff from these organisations are trained in fauna handling and have been vaccinated. The public and non-trained staff should not handle sick, dead or injured GHFF.

Actions:

- Specifications for construction and maintenance activities should include contact details and should require an induction for staff.
- Bush regenerators working at the subject site should be vaccinated or, as a minimum, be inducted regarding safety protocols.
- Include advice on Councils' and WCPS website about what to do if you find a GHFF.
- Educate Council staff/contractors and volunteers about safety protocols regarding GHFF e.g. during site inductions.
- Install signage around the camp to notify the public of risks and protocols (see **Section 4.3**).

Performance target:

- Appropriate health and safety protocols are followed in all cases.

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan

4.3 Community education and concerns*Actions:*

- Install informative signage around the camp.
- Update Council's website and environmental education material/programs to include positive messages about:
 - the use of bat friendly fruit tree netting
 - the ecological importance of flying-foxes as pollinators and seed dispersers
 - what to do if you find an injured or dead GHFF
 - commonly asked questions on native wildlife (this may also help to manage some complaints), such as: what are the health risks from GHFF, can I get sick from odour or faecal drop, how long will noise last from bats feeding in trees, how can I clean faecal droppings
 - develop a complaints protocol so that staff know to refer complaints about GHFF for the environmental officer
 - pest animal control
- Investigate the suitability of installing protective covers (e.g. shade sails) to reduce faecal drop on sensitive areas. Consider costs for ongoing maintenance.
- Liaise with Bushcare volunteers, the Manly Environment Centre and other community groups to determine if there would be interest in participating in regular GHFF counts i.e. 'bat watch'.
- Educate the community about the need to control domestic and pest animal species.

Performance targets:

- Current information available to the community.
- Prompt and consistent response to complaints.

4.4 Population monitoring

A number of other GHFF camps are being dispersed in the Sydney metropolitan area and this is likely to place greater pressure on remaining camps such as Balgowlah. It is the responsibility of the Council dispersing a camp to manage any issues arising from the dispersal. To assist with this it is recommended that Manly Council continue to support GHFF population monitoring being undertaken at Balgowlah by the RBGDT.

Action:

- Continue bat counts by RBGDT.
- Respond quickly to notify relevant Councils/agencies if there is a sudden increase in the GHFF population at Balgowlah.
- OEH to establish a forum with Councils and other agencies to share count data and other information relevant to GHFF camp management.
- Monitor fly-out directions and bat strike to determine trends.

Performance target:

- Obtain good quality data as a basis for prompt future decision-making.

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

4.5 Vegetation management

A program of bush regeneration is needed to ensure the subject site provides suitable habitat for GHFF in the long term. It is expected that OEH and DOE would impose restrictions on bush regeneration activities at the GHFF camp as part of a licence approval, as has occurred for other camps.

Table 2 and **Table 3** set out a monthly calendar to indicate periods when bush regeneration activities may be suitable according to GHFF life cycle stages. This includes likely restrictions to be applied in core roosting habitat, potential habitat and other habitat types throughout the subject site during different months of the year to reflect the life cycle stages of the GHFF.

Action:

- High priority should be given to removal of Morning Glory and other vines that are threatening canopy trees (i.e. GHFF habitat). Highest densities of these vines are currently in the central western part of the core habitat.
- Treatment should involve 'skirting' the base of vines with hand tools (i.e. cut at ground level). The vine should be left to die in situ. The base of the vine and any regrowth should be sprayed. Where possible, collect and remove vine seeds.
- Primary works are estimated to take approximately 20 person hours and should be conducted in Autumn/Winter.
- Secondary/maintenance should involve spraying the regrowth. This is estimated to take approximately 10 person hours and should be conducted during the growing season.
- Longer term bush regeneration should be to enhance GHFF habitat. Regenerating species should be consistent with species from the Dry Sclerophyll Forest community.



Figure 14: Revegetation with canopy tree species that will eventually provide GHFF roost habitat

**Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan**

Performance criteria:

- First year: 50% reduction in established vines measured from initial assessment. Suppression of vine regrowth. New outbreaks of weeds in previously treated areas are suppressed.
- Subsequent years: A further 50% reduction in vine densities measured from previous year. Further suppression of vine regrowth. New outbreaks of weeds in previously treated areas are suppressed.

4.6 Heat stress management

A heat stress protocol for the GHFF camp should be developed, similar to that in Stanvic et al (2013). Mitigation measures such as spraying and triage should only be conducted by ecologists and volunteers who have been vaccinated.

Actions:

- Prepare a contact list of staff and volunteers who can assist with camp management on hot days.
- Monitor the GHFF for signs of stress during extreme hot weather.
- If there are signs of stress, lower the temperature within the camp on hot days by:
 - spraying/pumping/misting water into the camp using large water pumps and hoses
 - spraying or misting water directly onto heat stressed individuals using small hand held pumps
- Treat GHFF in triage as needed on hot days.

Performance targets:

- Minimise GHFF deaths during heatwaves.

4.7 Street trees and parks

Actions:

- Council to develop planting guidelines for street trees and parks to increase the availability of GHFF feed trees in suitable locations.
- Remove problematic feed trees where there are ongoing complaints and offset plant in more suitable locations.

Performance targets:

- Increase foraging habitat in suitable locations throughout the LGA.

5 Implementation

5.1 Responsibilities

Manly Council is responsible for implementation of this plan and will be supported by OEH.

Where possible, grant funding applications should be made jointly with Warringah Council, which is responsible for land on the northern side of the creek, and community organisations where possible to increase the chance of success.

5.2 On-ground works

All teams involved in on ground works (e.g. infrastructure construction or maintenance, or bush regeneration) need to include a person with demonstrated relevant experience in wildlife handling and ecology to monitor bat stress levels. That person would have authority to issue stop work orders if needed i.e. if the bats appear to be stressed and at risk. Alternatively, the team needs to engage an ecologist with suitable experience or have a representative from WIRES or Sydney Metropolitan Wildlife Services present during on-ground works.

All members of the bush regeneration team need to be qualified (minimum Certificate II or III in Conservation and Land Management) and experienced. It is preferable that they are vaccinated for the ABL prior to working in the camp.

All on-ground works need to be performed in accordance with a Safe Work Method Statement that includes information about risks and working in a GHFF camp.

5.3 Licences and approvals

Council will need to obtain two licences from OEH to conduct work in the GHFF camp.

Section 132C

Under section 132C of the *National Parks and Wildlife Service Act 1974*, OEH requires a bush regeneration licence to be issued for 2-5 years for landholder managed sites. The bush regeneration licence covers activities for conservation purposes in Threatened Ecological Communities, the habitat of threatened species or critical habitat.

Decisions on licence applications are made within 4-6 weeks. Applications for the initial licence cost \$50 and need to include a site plan, program of works and bush regeneration checklist. The licence requires that an annual report and data need to be submitted.

Section 91

A Section 91 Licence under the *Threatened Species Conservation Act 1995* is needed from OEH to harm or pick a threatened species, population or ecological community, or damage habitat. The licence will be issued for five years to cover routine camp maintenance activities such as mowing, bush regeneration, and infrastructure maintenance. It is anticipated that construction of the basin will be permitted under this licence in accordance with the restrictions outlined in this plan.

This plan should be submitted to OEH for approval with a completed s91 licence application form.

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Federal approvals

Federal approvals are not likely to be needed for work as described in this plan because the camp does not meet the threshold size for consideration and approvals. However, it is recommended that Council contact the DOE prior to implementation to confirm this is the case.

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

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ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan

Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

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**Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan**
Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Appendix A Count data by RBGDT

The table below shows the results of counts undertaken by the RBGDT at the Balgowlah camp. Only one Little Red Flying-fox has been recorded at the site.

Date	GHFF	BFF
5/08/2010	214	
19/08/2010	230	
16/09/2010	260	
14/10/2010	0	
25/11/2010	50	
23/12/2010	150	
19/01/2011	180	
17/02/2011	400	
17/03/2011	450	
13/04/2011	1050	
12/05/2011	1100	
16/06/2011	1150	
21/07/2011	250	
18/08/2011	0	
21/09/2011	n/a	
19/10/2011	n/a	
16/11/2011	n/a	
21/12/2011	250	
18/01/2012	0	
15/02/2012	0	
21/03/2012	0	
18/04/2012	n/a	
17/05/2012	n/a	
14/06/2012	120	
5/07/2012	10	
19/07/2012	0	
16/08/2012	0	
13/09/2012	0	
11/10/2012	0	
15/11/2012	1050	
20/12/2012	850	
23/01/2013	700	
14/02/2013	500	
14/03/2013	500	
10/04/2013	1050	
15/05/2013	2500	
12/06/2013	430	

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan

Balgowlah GHFF Management Plan

Date	GHFF	BFF
24/07/2013	3000	
14/08/2013	3000	
11/09/2013	3000	
16/10/2013	3200	
13/11/2013	3250	20
12/12/2013	2350	20
15/01/2014	2300	15
20/02/2014	2300	10
20/03/2014	2550	20
17/04/2014	440	10
15/05/2014	5700	50
12/06/2014	5900	40
10/07/2014	5200	25
14/08/2014	3400	70
25/09/2014	3100	55
16/10/2014	3100	40
20/11/2014	3500	110
18/12/2014	3600	70
22/01/2015	3400	50
19/02/2015	5100	50

Appendix B Human health and GHFF

The fact sheet below explains the transmission, disease symptoms and health implications for each virus. <http://www.health.nsw.gov.au/environment/factsheets/Pages/flying-foxes.aspx>

Australian Bat Lyssavirus

The ABLV is closely related to the rabies virus and in Australia infects four species of flying-fox (including GHFF) and a number of microchiropteran bat species (NSW Health 2013). There have been three recorded cases of ABLV since the virus was identified in Australia, all of which have resulted in the death of the infected person. The mode of transmission of ABLV is through virus-laden saliva from infected animals introduced via a scratch or a bite, contamination of mucous skin or broken skin (NSW Health 2013).

The expression of ABLV among wild populations of bat species is thought to be very low (DAFF 2007). Generally flying-foxes infected by ABLV have been recorded from the north and eastern coastal areas, as far inland as Narromine in NSW and near Mount Isa in Queensland (Garner and Bunn 1997, Field and Ross 1999, Animal Health Australia (AHA) 2009). Serological surveys for the viral antigens suggest that ABLV may have a broad geographic range in flying-foxes across much of Australia (Field 2005, AHA 2009).

According to AHA (2009), flying-foxes affected with ABLV show a range of clinical symptoms that may be difficult for members of the general public to determine, and would be more difficult among school children with disabilities. These symptoms include overt aggression, paresis and paralysis, seizures and tremors, weakness, respiratory difficulties and change of voice. These symptoms are not exclusive to ABLV infection and be caused by other factors (Australian Animal Health (AAH) 2009). Affected animals can be found on the ground or low in a tree, and are unwilling or able to fly. ABLV also occurs in dead or dying flying-foxes, or those that appear to be suffering from another disease such as lead poisoning or angiostrongylosis (AAH 2009). Therefore, it should always be assumed that all Australian bat species have the potential to carry and consequently transmit ABLV (DoHA 2012).

The virus may incubate for 3-8 weeks following contraction, after which it affects the central nervous system and can be fatal if left untreated. Early symptoms of ABLV in humans are flu-like and include headache, fever, aversion to fresh air and water, weakness and fatigue. The disease can progress rapidly and malaise, delirium, convulsions, coma and death occur within a week or two (NSW Health 2013).

People at most risk of becoming infected by ABLV are those whose occupation includes volunteering or recreation activities resulting in exposure to potential diseased flying-foxes (DoHA 2012). However, there is a vaccine that can be administered prior to and after being bitten or scratched that can prevent disease, illness and death among humans. According to NSW Health and AHA (2009), contact or exposure to bat faeces, urine or blood will not pose a risk of exposure to ABLV.

Hendra virus

The Hendra virus, which is also known as the equine morbillivirus or bat paramyxovirus no.1 was first discovered in Australia following an outbreak of illness among horses at a large racing stable near Brisbane, Queensland (NSW Health 2012). To date, the virus has resulted in seven known human infections, of which there have been four deaths (NSW Health 2012). The transmission of the virus

**Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox
Camp - Management Plan
Balgowlah Grey-headed Flying-fox Camp Management Plan**

Balgowlah GHFF Management Plan

appears to have occurred through horses consuming food that is contaminated by the faeces from infected flying-foxes.

Human symptoms include fever, cough, sore throat, headache and tiredness which can develop between 5-21 days following contact with infectious horses. Further symptoms associated with meningitis or encephalitis (inflammation of the brain) can also develop, resulting in headache, high fever, drowsiness and sometimes convulsions and coma (NSW Health 2012).

There is no evidence of Hendra being transmitted from bat to humans, or from human to human (NSW Health 2012). In addition, it also appears that the Hendra virus is not readily transmitted between infected and un-infected horses (NSW Health 2012).

Menangle virus

The Menangle virus (also known as bat paramyxovirus no.2) was first isolated from stillborn piglets from a NSW piggery in 1997. Little is known about the epidemiology of this virus, except that it has been recorded in flying-foxes, pigs and humans (Australian Wildlife Health Network (AWHN) 2010). The virus caused reproductive failure in pigs and severe febrile illness in two piggery workers employed at the same Menangle piggery where the virus was recorded (AWHN 2010). The virus is thought to have been transmitted to the pigs from flying-foxes via an oral-faecal matter route (AWHN 2010). Flying-foxes had been recorded flying over the pig yards prior to the occurrence of disease symptoms.

The two infected piggery workers made a full recovery and this has been the only case of Menangle recorded in Australia.

ATTACHMENT 1

Environmental Services Division Report No. 17.DOC - Balgowlah Grey-Headed Flying-Fox Camp - Management Plan Balgowlah Grey-headed Flying-fox Camp Management Plan



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ATTACHMENT 1

Environmental Services Division Report No. 18.DOC - Proposed Adoption of Amendment No. 5 to Manly Development Control Plan 2013 Regarding Miscellaneous Amendments – Post Exhibition Proposed Amendment No.5 to Manly DCP 2013

ATTACHMENT - DETAILS OF PROPOSED AMENDMENTS TO MANLY DEVELOPMENT CONTROL PLAN 2013

(Drafted in order in which the amendments are to appear in the DCP)

- Update various citations and summary table of amendments to reflect 'Amendment 5'
- Minor correction at paragraphs 2.1.2.1.d and e. to clarify terminology consistent with dictionary meanings by replacing 'residential flat development' with 'residential flat buildings, multi dwelling housing, attached dwellings'.
- Minor edit at paragraph 3.2.2.2 to improve clarity by moving reference to 'original cladding (including slate)' from paragraph 3.2.2.2.a to paragraph 3.2.2.2.c.
- *Insert at paragraph 4.1.3 - Floor Space Ratio as follows:*

4.1.3.3 Exceptions to FSR for Open Balconies

Objective To maintain open balconies which contribute to the articulation of building facades without adding to the building bulk and provide an amenity of open space for occupants.

In calculating the Gross Floor Area under the LEP dictionary meaning for the purpose of calculating FSR, balconies that are enclosed will not be excluded from the LEP definition of Gross Floor Area i.e. will be included in FSR when the balcony is:

- i) enclosed to the extent that it is part of the building envelope as defined by the Building Code of Australia; and
- ii) considered by Council to have the character of a habitable room.

Note: In this regard it is noted that the LEP only excludes balconies from the Gross Floor Area when the outer walls are less than 1.4m high.

- *Insert at paragraph 4.1.4 - Setbacks (in relation to corner splay lots) as follows (in red):*

4.1.4 Setbacks (front, side and rear)

Note: This section addresses the buildings' setback from its various property boundaries.

Relevant DCP objectives to be met in relation to this part include:

Objective 1) To maintain and enhance the existing streetscape.

Objective 2) To ensure and enhance local amenity by:

- providing privacy;
- providing equitable access to light, sunshine and air movement; and
- facilitating view sharing and maintaining adequate space between buildings to limit impacts on views and vistas from private and public spaces.
- *facilitating safe and adequate traffic conditions including levels of visibility around corner lots at the street intersection.*

Environmental Services Division Report No. 18.DOC - Proposed Adoption of Amendment No. 5 to Manly Development Control Plan 2013 Regarding Miscellaneous Amendments – Post Exhibition
Proposed Amendment No.5 to Manly DCP 2013

See also objectives at paragraph 3.4 Amenity.

Objective 3) To promote flexibility in the siting of buildings.

Objective 4) To enhance and maintain natural features by:

- accommodating planting, including native vegetation and native trees;
- ensuring the nature of development does not unduly detract from the context of the site and particularly in relation to the nature of any adjoining Open Space lands and National Parks; and
- ensuring the provisions of State Environmental Planning Policy No 19 - Urban Bushland are satisfied.

Objective 5) To assist in appropriate bush fire asset protection zones.

4.1.4.1 Front setbacks

See also paragraph 3.2.4 in relation to Heritage and paragraph 4.2 in relation to controls in LEP Business Zones.

- a) Front setbacks must relate to the front building line of neighbouring properties and the prevailing building lines in the immediate vicinity.
- b) Where the front building line of neighbouring properties is variable and there is no prevailing building line in the immediate vicinity i.e. where building lines are neither consistent nor established, a minimum 6m front setback applies.
- c) Projections into the front setback may be accepted for unenclosed balconies, roof eaves, sun-hoods, chimneys, meter boxes and the like, where no adverse impact on the streetscape or adjoining properties is demonstrated to Council's satisfaction.

Note: Reference to 'consistent' or 'established' building lines in this paragraph is determined by the context and site analysis accompanying the DA (see paragraph 2.1.1) including demonstrated survey of all building lines and frontages in the vicinity i.e. the visual catchment along the street.

4.1.4.2 Side setbacks and secondary street frontages

- a) Setbacks between any part of a building and the side boundary must not be less than one third of the height of the adjacent external wall of the proposed building.
- b) Projections into the side setback may be accepted for unenclosed balconies, roof eaves, sun-hoods, and the like, if it can demonstrate there will be no adverse impact on adjoining properties including loss of privacy from a deck or balcony.
- c) Windows of living and dining areas in new dwellings are to be setback at least 3m from side boundaries;
- d) For secondary street frontages of corner allotments, the side boundary setback control will apply unless a prevailing building line exists. In such cases the prevailing setback of the neighbouring properties must be used. Architecturally the building must address both streets.
- e) Side setbacks must provide sufficient access to the side of properties to allow for property maintenance, planting of vegetation and sufficient separation from neighbouring properties. See also paragraph 4.1.4.3.b.vi of this plan.
- f) **In relation to the setback at the street corner of a corner allotment the setback must consider the need to facilitate any improved traffic conditions including adequate and safe levels of visibility at the street intersection. In this regard Council may consider the need for building works including front fence to be setback at this corner of the site to provide**

Environmental Services Division Report No. 18.DOC - Proposed Adoption of Amendment No. 5 to Manly Development Control Plan 2013 Regarding Miscellaneous Amendments – Post Exhibition
Proposed Amendment No.5 to Manly DCP 2013

for an unobstructed splay. The maximum dimension of this triangular shaped splay would be typically up to 3m along the length of the site boundaries either side of the site corner.

See also paragraph 5.5 Road Widening and Realignment and Council's Corner Splay Policy (C150) for instances where the corner splay may be acquired by Council at intersections in the public interest and in the circumstances of the particular case.

- *Insert at paragraph 4.1.6 - Parking, Vehicular Access & Loading as follows:*

4.1.6.6 – Tandem, Stacked and Mechanical Parking Areas

The design location and management of parking facilities involving tandem, stacked and mechanical parking (including car stackers, turntables, car lifts or other automated parking systems) must consider the equitable access and distribution of parking spaces to all occupants and visitors to the building. In this regard:

- i) all parking spaces in any tandem or stacked arrangement are to be allocated to the same dwelling/strata unit and must not be used as visitors parking;
- ii) where the proposed development involves a tandem, stacked and mechanical parking arrangement which necessitates more than one parking space being attributed to a single dwelling unit under paragraph i) above; Council must be satisfied that sufficient parking spaces are reasonably allocated to all other dwelling units within the development.

- *Insert at paragraph 4.2.3 – Setbacks (in relation to corner splay lots - Business Zones) as follows (in red):*

4.2.3 Setbacks Controls in LEP Zones B1 and B2

Relevant DCP objectives in this plan to be met in relation to this paragraph include the following:

Objective 1) To ensure unobstructed access between the private and public domain.

Objective 2) To maintain the existing streetscape of building to the boundary.

See also paragraphs 4.2.5 to 4.2.8 for specified setback provisions for Manly, Balgowlah, Seaforth Local Centres and Neighbourhood Centres.

All buildings must be constructed to the public road and side boundaries of the allotment except where:

- a) an alternative setback is identified on the townscape and opportunities maps or having regard to established building lines and whether they contribute positively to the streetscape; or
- b) the applicant can demonstrate to the satisfaction of the Council that an alternative setback will not conflict with overall townscape objectives, reduce the general availability of retail frontage or remove weather protection for pedestrians; or
- c) the stipulated setback would be undesirable in terms of the amenity of any residential uses existing on adjoining land or proposed for inclusion in the development. In such cases the planning principles in this plan for residential development at paragraph 3.1.1 will also apply.

Environmental Services Division Report No. 18.DOC - Proposed Adoption of Amendment No. 5 to Manly Development Control Plan 2013 Regarding Miscellaneous Amendments – Post Exhibition
Proposed Amendment No.5 to Manly DCP 2013

- d) Council considers the need for building works to be setback at corner lots/street intersections to provide for an unobstructed splay for the purpose of improved traffic visibility. The maximum dimension of this triangular shaped splay would be typically up to 3m along the length of the site boundaries either side of the site corner. See also paragraph 5.5 Road Widening and Realignment and Council's Corner Splay Policy for instances where the corner splay may be acquired by Council at intersections in the public interest and in the circumstances of the particular case.
- Minor correction at paragraph 4.2.4.4.d. – Loading bays to improve clarity by deleting the words “**subject to**” and replacing them with the word “**considering**”.
 - Minor correction at paragraph 4.2.5.1.a.viii. to improve clarity by replacing “**step back development at rear to reveal the historic building (church) at the corner of Sydney Road and Whistler Street**” and replace with the words “**step back development around the intersection of Sydney Road and Whistler Street to reveal the historic building (church) at this intersection.**”
 - Minor update to insert reference to **Council's Advertising and Advertisements Policy (A20)** at paragraph 4.4.3 – Signage.
 - Insert at paragraph 4.5 – Road Widening and Realignment as follows (in red):

5.5 Road Widening and Realignment

Development must not encroach upon land required for local road widening or realignment. Council's local road widening or realignment schemes are generally indicated at Schedule 1 – Map E of this plan and more specific details may be obtained from Council's Civic and Urban Services Division to verify requirements for any road realignment and/or a corner splay to facilitate improved traffic conditions.

Note: Requirements for local road widening or realignment may arise in relation to significant redevelopment of properties effected by an adopted local road widening or realignment scheme. Further clarification of any pending dedication of land adopted by Council may be obtained from Council's Civic and Urban Services Division.

See also paragraphs 4.1.4.2.f and 4.2.3.d in relation to requirements for splayed setbacks at the street corner of corner lots for residential development and in the business centres respectively.

See also Council's Corner Splay Policy (Council Policy Reference C150) providing for the acquisition of corner splays at intersections in the public interest and in the circumstance of the particular case’.

- Update title of “Schedule 1 - Map B – Residential Open Space and Landscaping Area” to more accurately read “**Schedule 1 - Map B – Residential Open Space Area**”.
- Update **Schedule 12 – Extracts from Environmental Planning and Assessment Act 1979** to incorporate minor amendments to the Act since commencement of the DCP.