



Batemans Bay Flying-fox Camp Dispersal Report

Prepared for
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Abbreviations

Abbreviation	Description
ABLV	Australian Bat Lyssavirus
ELA	Eco Logical Australia
GHFF	Grey-headed Flying-fox
LRAD	Long range acoustic device
OEH	Office of Environment and Heritage

1 Introduction

1.1 Purpose of this report

In June 2016, Eurobodalla Shire Council commenced dispersal of the flying-fox camp at Batemans Bay in accordance with Federal and State Government approval conditions.

This report has been prepared for the NSW Office of Environment and Heritage (OEH) to summarise the activities and outcomes relevant to the dispersal of the flying-fox camp. These activities and outcomes include:

- dispersal location, team, types of activity
- an assessment of the outcome of the action, including reactions of the GHFF
- results of pre and post-action population monitoring
- information about new camps e.g. location, extent, numbers.

This report relates to activities conducted in the quarter ending 31 July 2016. Information in this report summarises matters that were raised in daily and weekly reports to OEH regarding the dispersal throughout this period.

A separate reports will be provided by Council to OEH regarding community feedback and financial expenditure.

This information is provided as a record of what occurred in the subject period, with the aim to learn from the experience and share knowledge about flying-fox camp dispersal programs.

1.2 Dispersal objectives and approach

The overall objective was to disperse the flying-fox camp in a manner consistent with the approval conditions. The program for on-ground action was developed in collaboration with OEH, Council and the consultants. It aimed to minimise the risk of:

- harming flying-foxes
- fragmenting the camp into inappropriate areas
- adversely impacting the community through dispersal activities.

A precautionary approach was taken because of the high potential risk associated with attempting to disperse a camp of such a large size and fragmented nature, plus the limitations of available specialist resources. The approach also recognised the strong community feelings regarding the camp and the need to deter unauthorised or uncontrolled action.

It was decided that the entire camp would not be subject to dispersal in one go because the risks of such an approach would be unacceptable (ie. likely to harm flying-foxes, fragment the camp and/or increase impacts to the community). Instead, the dispersal was conducted incrementally starting at the areas of greatest conflict and where vegetation buffer clearing had been approved. Vegetation adjacent the golf course at the centre of the camp was identified as the last area that should be targeted for dispersal as this had relatively low levels of conflict with residents and provided large area of roost habitat for the flying-foxes.

The OEH approval (Section 95(2) Certificate under the *Threatened Species Conservation Act 1995*) allowed for dispersal activities to continue for up to a total of 2.5 hours in a 12 hour period. To minimise potential impacts to the flying-foxes and surrounding residents consistent with the precautionary approach, dispersal was conducted for only 1-1.5 hours each day (excluding days when there was a stop work trigger due to adverse weather as described in **Section 4.5**).

1.3 Camp extent

Areas that were subject to dispersal are shown in **Figure 1** and are referred to as:

- the rear of houses along Albatross Rd (Albatross Rd)
- Lake Catalina
- Water Gardens
- adjacent the pump station at Bavarde Ave (Bavarde Ave)
- golf course fairways and adjacent vegetation (golf course).

1.4 Learnings about the approach

The incremental and precautionary approach was found to be effective because the dispersal:

- did not noticeably harm flying-foxes, although it is acknowledged that they would have experienced some stress
- as far as could be ascertained through monitoring and reports from wildlife carers in the region, no flying-foxes died as a result of the dispersal
- did not result in splinter camps
- did not adversely impact the community to a significant extent, although the noise from dispersal activities in the early morning carried across the neighbourhood.

It is worth noting that the camp had started to naturally migrate northward due to changes in seasonal food supply when the dispersal actions started in June 2016. It is not possible to determine to what extent the dispersal actions contributed to the overall natural migration of the flying-fox population. However, it appeared that the targeted actions assisted with movement of flying-foxes from areas of greatest conflict with adjacent residents.



Figure 1: Dispersal areas

2 Resources

Detailed planning and organising resources (people and materials) for the dispersal commenced in May 2016, and involved staff from Council, OEH and a specialist consultant team (Eco Logical Australia).

2.1 People

It was important for everyone involved in the dispersal to have a clear understanding about the hierarchy of communication and accountability, and the responsibilities of different roles (refer to **Table 1**). This was emphasised during inductions and tool box talks.

Table 1: Roles and responsibilities

Roles	Responsibilities
NSW Office of Environment & Heritage (OEH) Commonwealth Department of Environment (DoE)	Regulators
Dispersal Director	Represents Eurobodalla Shire Council Oversees dispersal program
Dispersal Manager	Accountable to the Dispersal Director Experienced and vaccinated ecologist Manages entire dispersal team and activities on any given day
Dispersal Team Leaders	Accountable to the Dispersal Manager Vaccinated ecologists Supervise up to five Dispersal Team Members Raise any animal welfare or safety concerns with the Dispersal Manager
Dispersal Team Members	Accountable to a Dispersal Team Leader Recruited by Council from the general community through expressions of interest; included some volunteers Raise any animal welfare or safety concerns with the Dispersal Team Leader
Other roles	
Council	Human resources, procurement, community liaison and communications
Consultant	Project management
Volunteer wildlife carers	Provided training and advice, on-call to assist with wildlife care
Community	To report possible splinter camps and provide feedback

The number of personnel needed to participate in dispersal activities on any given day was determined by the program for on-ground works (see **Section 3**) and availability of suitable staff. About 70 people were directly involved in the dispersal action (this does not include Council staff and contractors involved in the removal of vegetation to create buffers between residences and the camp). The number of people that participated in dispersal each week is indicated in **Table 2**.

To maintain consistency, the Dispersal Manager was involved for the entire duration of the program and changes to the Dispersal Team Leaders were kept to a minimum. This was a significant commitment and

logistical challenge. Similarly, many Council staff involved in the dispersal needed to be reassigned from their usual activities.

Council's Dispersal Director was involved in the dispersal activities and monitoring, which helped to facilitate communication between Council staff, Councillors, the community, regulators and others.

Table 2: Summary of dispersal activities

Week	Dates (excluding Sunday)	Primary dispersal area	Maintenance dispersal areas	Number in team*	Stop work triggers
1	22 June to 25 June	<ul style="list-style-type: none"> Albatross Rd Lake Catalina (from 24/6) 	<ul style="list-style-type: none"> Not applicable 	7 - 12 (15)	None triggered
2	27 June to 2 July	<ul style="list-style-type: none"> Albatross Rd Lake Catalina Water Gardens (from 29/7) Bavarde Ave (1-2/7) 	<ul style="list-style-type: none"> Albatross Rd Lake Catalina 	11 - 20 (23)	None triggered
3	4 July to 9 July	<ul style="list-style-type: none"> Golf course (fairways only) 	<ul style="list-style-type: none"> Albatross Rd Lake Catalina Water Gardens 	20 - 22 (28)	Two Severe Weather Warnings
4	11 July to 16 July	<ul style="list-style-type: none"> Golf course 	<ul style="list-style-type: none"> Albatross Rd Lake Catalina Water Gardens 	14 - 23 (33)	Two Severe Weather Warnings
5	18 July to 23 July	<ul style="list-style-type: none"> Golf course 	<ul style="list-style-type: none"> Albatross Rd Lake Catalina Water Gardens 	18 - 20 (35)	None triggered
6	25 July to 30 July	<ul style="list-style-type: none"> Golf course 	<ul style="list-style-type: none"> Albatross Rd Lake Catalina Water Gardens 	20 - 24 (38)	One Severe Weather Warning

*total people included on roster that week is shown in brackets

2.2 Materials

All personnel involved in on-ground dispersal activities were required to wear suitable protective clothing such as boots, long pants and long-sleeved shirt.

The following equipment was sourced to support the dispersal activities and ensure high safety standards:

- high-visibility vests
- gloves
- ear plugs
- safety glasses
- head torches
- torches, some high powered and with option to use flicker
- portable light towers (the type used during night road works)
- whistles
- cow bell
- metal pots, pans and trays
- speakers with iPhone connection
- LRAD – a range of sizes and sounds were used
- disposable overalls (these were offered but not used)
- insect repellent
- first aid kits.

The team also used sticks found on-site to bang together to make noise.

Portable light towers (typically used during night road works) were directed onto trees where the terrain was suitable. This was a highly effective technique because it did not disturb the neighbours and was a low-stress deterrent to flying-foxes coming in to roost. The limitations were the inability to adjust the angle of the lights into the upper canopy rather than the mid-canopy. These light towers were available because they were also being used to assist the vegetation removal at night when the camp was empty of flying-foxes.

A specialist LRAD operator was engaged by Council to support the project and operated under instruction from the Dispersal Manager. A number of LRAD sizes and sounds were trialled (e.g. metallic sounds, music, predator noises such as sea eagles). The main conclusion from the LRAD trials was that it is important to have a variety of sounds because the flying-foxes became accustomed to noises that were repeated over time which reduces its effectiveness. Care was taken to achieve a balance between deterring the flying-foxes from roosting as they flew in and causing unacceptable levels of stress to nearby animals and people.

2.3 Transport and base

The Batemans Bay Community Centre was invaluable in providing a meeting place for the dispersal team each day within close proximity to the camp. The office at the centre provided administrative support to the team. The centre also had toilets and kitchen facilities for tea and coffee.

Council provided a mini-bus to assist with transporting the team from the Community Centre to and from the dispersal sites. Some Team Leaders transported members of their team via cars as well.

2.4 Learnings about resources

Key points are:

- roles and responsibilities need to be clearly defined and communicated
- logistics are challenging when there is a team of this size requiring specialist resources in a regional centre
- inexpensive materials and equipment to make light and noise can be just as effective as more expensive materials
- use of the LRAD needed to be carefully managed
- the light towers are recommended as a low impact technique to deter flying-foxes from landing, although it would be preferable to be able to angle the lights in different directions.

3 Monitoring

3.1 Baseline monitoring

Baseline monitoring of the camp was done by a team of ecologists the day prior to the commencement of dispersal, on 21 June 2016. This was done to check if there were any heavily pregnant females or dependent young which constitute as stop work triggers for dispersal. No stop work triggers were observed.

The results of baseline monitoring were consistent with regular weekly monitoring that had been conducted by OEH which indicated that the camp size was gradually reducing from its maximum in April 2016. Around June the numbers of flying-foxes in camps further north (e.g. in Sydney) were reported to be increasing. This is a typical pattern of the Grey-headed Flying-fox which relates to the seasonality of food resources.

3.2 Dispersal monitoring

All personnel participating in dispersal were instructed on signs of flying-fox distress and other animal welfare issues to watch out for. For example, any individual flying-fox showing possible signs of:

- fatigue such as low flying, laboured flight, settling despite dispersal efforts
- panting, saliva spreading, located on or within 2 m of the ground
- injury or death of flying-foxes.

Any concerns were immediately raised with or by the Team Leaders and discussed with the Dispersal Manager, and either further monitoring was done or dispersal activities were adjusted accordingly (e.g. cease noise). A precautionary approach was used at all times.

3.3 Post-dispersal monitoring

The camp was monitored every day by ecologists to determine how the flying-foxes had responded to dispersal actions and inform planning for the following day. Daily monitoring was conducted by pairs of ecologists at multiple locations throughout the camp using binoculars and spotter scopes. Data (e.g. roost location and welfare) was recorded digitally.

The flying-foxes were observed closely during monitoring to ensure no animal welfare issues arose. All possible animal welfare issues were closely investigated (e.g. size of sub-adults, dead flying-foxes, signs of possible stress), often with repeated visits to sites over a number of hours or days as needed to assess the situation.

Any reports of potential splinter camps were investigated by ecologists, however, there were no confirmed splinter camps.

3.4 Weekly monitoring by OEH

OEH continued to monitor the extent of the camp each week during the dispersal period. Results of the OEH monitoring were consistent with the camp extent mapped by the dispersal team.

3.5 Lessons about the monitoring

A camp of this size is difficult to monitor, even with a team of experienced ecologists. Access and visibility to some parts of the camp can be challenging. Recommended strategies to assist with monitoring are:

- work in pairs of ecologists to improve quality assurance and manage safety risks
- use good quality binoculars and spotter scopes
- wear appropriate clothing including use of waders in difficult to access wetland areas
- record information on digital devices to minimise the time and risks associated with data transfer.

When the camp was a large size, determining the number of flying-foxes was found to be less important for management purposes than mapping the extent of the camp. 'Counts' of the population varied widely when the population was large (e.g. the CSIRO estimated the peak population at about 270,000; others suggested 100-300,000), but became more consistent / accurate as the population size reduced to <50,000. Even when the population size was relatively low, maps of the camp extent were more important than counts of the numbers of flying-foxes.

4 On-ground activities

4.1 Period for dispersal

Dispersal of the Batemans Bay flying-fox camp was conducted from Wednesday 22 June 2016 until Saturday 30 July 2016, which is about six weeks. Dispersal activities were undertaken daily, excluding Sundays and days with stop work triggers (all due to strong winds). The timing of dispersal coincided with the main fly-in to the camp each morning prior to sunrise, with a maximum period of an hour and a half, from approximately 5.30 am to 7 am.

4.2 Inductions and tool box talks

All personnel involved in the dispersal were required to complete a Personnel Form and to read and accept the Safe Work Method Statement, which included conditions from OEH and protocols for handling sick and injured animals.

All people involved in the dispersal and visitors were subject to a general induction. This covered objectives of dispersal, a map of potential habitat in the area to raise awareness about the risks of shifting the camp to other unsuitable locations, roles and responsibilities, code of conduct, safety and risk assessment, types of dispersal activities, overview of the approach, procedures around the roster and sign in/off, conditions and triggers, awareness of public scrutiny, timing of dispersal activities, and stop work triggers.

During the induction, Dispersal Team Members were warned that any non-compliance with instructions from Team Leaders or the Dispersal Manager would result in dismissal from the team. There were no instances of non-compliance by Dispersal Team Members.

An additional induction with detailed information about animal welfare, including care and rescue protocols, was given to Team Leaders and the Dispersal Manager.

The Dispersal Manager gave a tool box talk each morning when the team met at the Community Centre to sign in, collect equipment and be assigned to Team Leaders. The tool box talks covered safety matters and other instructions such as where each team would be located. Each day, personnel were required to sign that they had heard and understood the tool box talk.

4.3 Primary and secondary dispersal

The sequence of primary and maintenance dispersal locations is given in **Table 2**. In summary, the southern areas of the camp at Albatross Rd and Catalina Lake were the first areas to be dispersed. These were maintained while primary dispersal activities were carried out at the Water Gardens. Finally, the golf course was subject to primary dispersal while Albatross Rd, Catalina Lake and the Water Gardens were maintained. By 30 July 2016, flying-foxes were roosting in a reduced area of the golf course, but no longer roosting in vegetation to the rear of Albatross Rd, at Catalina Lake or the Water Gardens. The total population had reduced to about 30-40,000 flying-foxes.

4.4 Dispersal techniques

Dispersal activities primarily involved creating light and noise using the equipment listed in **Section 2.2**. All personnel were instructed not to shine lights for too long (more than a few seconds) directly at flying-foxes.

4.5 Stop-work triggers

The OEH dispersal approval conditions identify a number of stop-work triggers. As indicated in **Table 2**, the only stop-work triggers enacted during the dispersal period were due to Severe Weather Warnings (Strong Winds) issued by the Australian Bureau of Meteorology BoM). Dispersal did not occur during any periods of severe weather.

Severe Weather Warnings may be issued by the BoM at any time which can make it challenging to notify the dispersal team in a timely manner. The team rostered on for each day was notified the evening prior to dispersal, and if a Severe Weather Warning was issued for the following day the dispersal activities were cancelled.

The main lesson from this is that it is important for the Dispersal Manager to carefully assess the weather conditions each day for potential risks to flying-foxes and the dispersal team, and take a precautionary approach.

The dispersal time and effort was generally reduced on the day or days following strong wind as a precaution to avoid flying-fox stress.

4.6 Animal handling

Some Dispersal Team Members chose to be vaccinated for Australian Bat Lyssavirus (ABLV), although this was not compulsory. At no stage were any Dispersal Team Members required to handle flying-foxes.

The Dispersal Manager and Team leaders were vaccinated for ABLV. There was only one occasion when a live GHFF was handled by the Dispersal Manager – that was during a rescue from the barbed wire fence on the edge of the golf course, which was unrelated to the dispersal activities (it was caused by noise from a trail bike during the daytime). All other GHFFs handled by the Dispersal Manager or Team Leaders were dead, usually the result of predation from birds of prey such as owls or eagles, or from old age.

4.7 Safety issues

There were two team safety issues on Saturday 16/7:

- one person tripped and had minor scratches and bruising
- one person took off their safety glasses before leaving the work area, against inducted safe work practices, which resulted in a fluid, which may have been flying fox urine, entering the person's eye.

Both people (Dispersal Team Members) were taken to the local hospital for medical attention and the Team Leader stayed with them until they had seen a doctor and were advised no further treatment was needed and they could leave. These incidents were reported to Council's Safety Officer and incident reports were completed.

There were no other safety incidents.

4.8 Lessons about on-ground activities

To minimise risks associated with on-ground activities it is important to have:

- clear communication materials and processes
- good administrative and project management systems and protocols

- a precautionary approach to stop-work triggers and reduced dispersal activities if there are any possible causes for concern.

5 General lessons

In addition to the lessons outlined in the above chapters, the following are noted. For a dispersal of this scale there needs to be:

- commitment to significant and suitable resources over long time period
- a strategic and precautionary approach focused on risk management
- open communication between all parties, including the community and regulators.

References

Eco Logical Australia Pty Ltd 2015. *Water Gardens Grey-headed Flying-fox Camp Management Plan*. Prepared on behalf of Eurobodalla Shire Council.

Eco Logical Australia Pty Ltd 2016a. *Batemans Bay Flying-fox Camp Draft Dispersal Plan*. Prepared on behalf of Eurobodalla Shire Council.

Eco Logical Australia Pty Ltd 2016b. *Batemans Bay Flying-fox Camp Management Options*. Prepared on behalf of Eurobodalla Shire Council.

Ecosure 2016. *Batemans Bay Flying-fox Camp Assessment – Supplementary Report*. Prepared on behalf of Eurobodalla Shire Council.

Department of Environment 2014. *Draft EPBC Act Policy Statement – Camp management guidelines for the Grey-headed and Spectacled flying-fox*.

OEH 2011. *Code of Practice of injured, Sick and Orphaned Protected Fauna*.

OEH 2012. *Code of Practice for Injured, Sick and Orphaned Flying-foxes*.

OEH 2015. *Flying-fox Camp Management Policy*.

OEH 2016. *Flying-fox Camp Management Plan Template 2016*.

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