



NATF Disaster Protocol For Disaster Events in Flying-fox Colonies

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Change History

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Contents

1	Background	2
2	Introduction.....	2
3	Disaster Protocol.....	4
3.1	Action Point Events.....	4
3.2	Level Three - Preparation.....	4
3.3	Level Two Monitoring	4
3.4	Level One Action	5
3.4.1	Level One A Heat Stress Escalating	5
3.4.2	Level One B On-site	6
4	Procedure Details	7
4.1	Team Clothes.....	7
4.2	Approaching and Spraying.....	7
4.3	Removal	8
4.4	Triage On-Site	9
4.4.1	Assessment.....	10
4.4.2	Actions	10
4.5	Triage Off-Site	11
4.6	Transport	12
4.7	Summary Table of Activities	12
5	Personnel.....	13
5.1	NATF Disaster Coordinator and Disaster Team	13
5.2	Flying-fox Controller	13
5.3	Monitor.....	14
5.4	Colony Coordinator.....	14
5.5	Vaccinated Teams	14
5.5.1	Colony Team.....	15
5.5.2	On-site Triage Team	15
5.5.3	Off-site Triage Team.....	15
5.5.4	Transporters	16
5.6	Non-vaccinated teams	16
6	Dead	16
7	Appendix A Status of heat effected flying-foxes and response:.....	18
8	Appendix B Care Sheets	19
8.1	Triage Care Sheet per Flying-fox.....	20
8.2	Triage Care Sheet per Cage.....	20
9	Appendix C Mortality Charts.....	22
10	Appendix D Colony Charts.....	26
11	Appendix E Contact Form	28
12	Appendix F Equipment and Use	29
12.1	Water	29
12.2	Tagging.....	30
12.3	Triage Kits.....	31
12.4	Misc.....	33

1 Background

The primary mass flying-fox incident is a heat stress event. Other disasters include, storms, bushfire and disease outbreaks.

Heat stress occurs when temperatures reach extremes in the campsite. Extremes usually mean greater than 40° over more than one day. Cool nights, intervening cool days, rain and cool understories mitigate the situation. High 30s in the days before, wind, lack of understory and disturbance exacerbate the situation.

The aim of this document is to provide the protocol for the following events:

- Heat-stress,
- Storm,
- Bushfire,
- Flood.

Disease is rare and more complicated and is not covered by this document.

The standard NATF Disaster protocol is the parent document for this document and covers all ancillary tasks such as the care of volunteers, media, etc.

There are short form documents for each process described here. They are for quick reference only. This document is the “point of truth” if there are any discrepancies between this document and the quick reference guides.

2 Introduction

Events

Heat stress is the most likely disaster event and becoming increasingly common. This document aims to provide procedures and role definitions to first of all to prevent a heat stress incident becoming a major disaster by prophylactic spraying and appropriate in-field treatment. Secondly to ensure the timely and effective treatment of collapsed flying-foxes (whatever the cause).

Due to the varying factors, described previously, which impact the drop from a heat event, it is important to know the layout and structure of each campsite and to monitor the situation as the temperatures begin to rise. See Appendices for charts for each campsite which provide a description of the camp, the structure of the colony and the conditions which require action. This information will also be of use during other disaster events in a campsite.

Generally storms, fires and floods have minimal, if any, warning so only generic preparation is possible. Heat stress events, however, usually have (relatively) slow lead times and so detailed preparation and monitoring can be carried out.

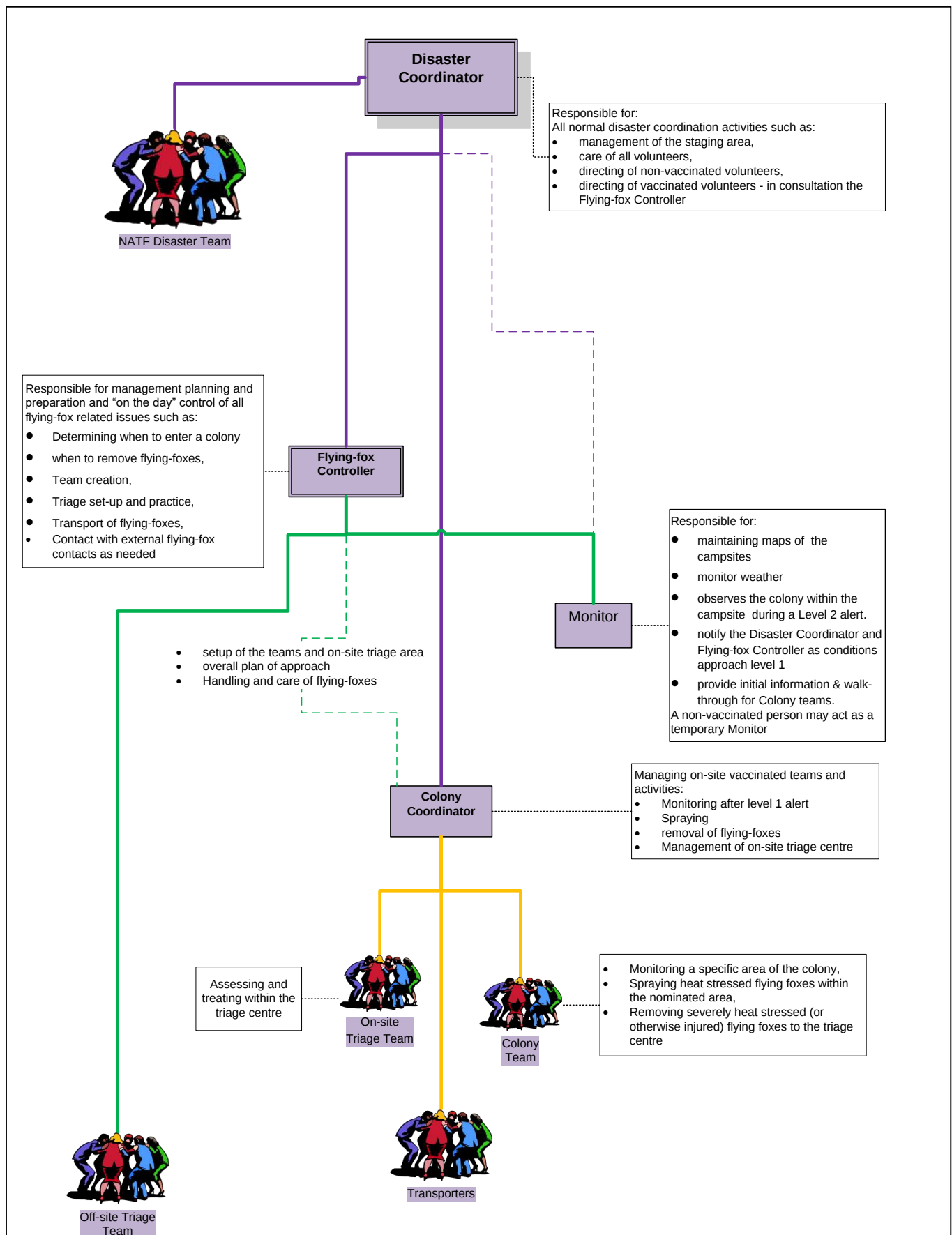
Roles

Unlike other wildlife disaster events the personnel on the ground will be vaccinated people not the normal trained NATF Disaster Team. The NATF Disaster team will provide logistical and administrative support.

In general the NATF Disaster Coordinator is responsible for the normal disaster coordination activities with the exception of those specifically taken on by the Flying-fox Controller. The

Flying-fox Controller will be responsible for issues involving flying-fox assessment and the activities of vaccinated team members.

Specifically the Disaster Coordinator or delegate will be responsible for the management of the staging area, the care of all volunteers, the directing of non-vaccinated volunteers, the



directing of vaccinated volunteers - in consultation the Flying-fox Controller and, where appropriate, the on-site senior flying-fox rehabilitators.

This document should be issued to all vaccinated NATF members and included in the training for bat care.

3 Disaster Protocol

3.1 Action Point Events

There are three main action levels for a heat-stress event.

Level three – Preparation: this is a biannual site review and planning stage (and applies to preparation for any disaster event)

Level two – Monitoring: this is triggered when a weather forecast indicates conditions with the potential to trigger a disaster. This will primarily be a heat stress event but storm or flood warnings may also trigger this level.

Level one – Action: this is triggered by escalating conditions (level 1A – heat stress only) or an actual event (level 1B all events).

3.2 Level Three - Preparation

This should occur at the end of the summer's hot period and be repeated in spring before the next season's hot period begins.

The site should be checked by the Monitor (see personnel section) for:

- the main features,
- any water sources (for the flying-foxes and for spraying),
- any changes in the structure of the camp,
- the composition of the colony, and,
- the position of the colony.

Maps and charts need to be updated and distributed to the Flying-fox Controller to form the site file. The Flying-fox Controller and the Disaster Coordinator should determine appropriate staging and triage sites and add the details to the site file. At least one triage site at the camp and one triage site in a building with air conditioning is required. If the off-site triage location is not a home then an alternative should be identified in case the first choice is not available on the day.

This is the time to investigate options for campsite spraying.

3.3 Level Two Monitoring

This should begin as soon as the spring/summer season starts to reach its warm period. Generally this will be temperatures rising above 30° but this may be modified for a particular campsite, see The Monitor should begin monitoring the weather forecasts (the Elders Weather website is usually very good) looking for any patterns which signal a possible:

- heat stress incident. These patterns generally mean a run of days over 35°, overnight minimums more than 20° and days reaching 40°. The exact pattern will depend on the campsite, or,

- storm event including: wind, hail or extreme cold (cold stress events are not unknown and can occur when the temperature drops suddenly after a hot period).

The file map and chart should be updated showing:

- any changes to staging and triage sites, and,
- the position of the colony including the make up within the colony (e.g. sub colony of blacks, area of lactating females).

When the weather forecast shows a pattern for a switch to Level One Action (see chart for the colony) then the NATF Disaster Coordinator and the Flying-fox Controller must be alerted.

3.4 Level One Action

There are two subsections to Level One Action:

- 1A standby – only relevant to a heat stress event,
- 1B on site.

3.4.1 Level One A Heat Stress Escalating

This level is triggered when the weather patterns for a particular colony indicate a high likelihood of a heat stress incident.

The Monitor should alert the NATF Disaster Coordinator (and the Flying-fox Controller) to put the teams on standby and notify external personnel as required. The Monitor should also ensure that sufficient current maps are available for all disaster personnel.

The colony should be checked by the Monitor, and / or by the teams, as required for a particular site, as per the protocol below:

Early morning colony check:

- status of flying-foxes,
- location of flying-foxes,
- area to be covered, and,
- report above to the Controller.

Middle of the day colony check:

- status of flying-foxes,
- location of flying-foxes, and,
- report above to the Controller.

Mid to late afternoon colony check:

- status of flying-foxes,
- location of flying-foxes, and,
- report above to the Controller.

3.4.2 Level One B On-site

Heat Stress

This level is triggered by the flying-foxes moving into the trunks of trees and starting to descend. The Disaster Coordinator or the Flying-fox Controller should call the teams to the site. The leader of each team should now be assisting or replacing the Monitor in the hourly review of the colony.

Each team is assigned a section of the colony, dependent on the size and make-up of the campsite and colony. The purpose of this is so that the team becomes familiar with the flying-foxes in their area and is better able to judge if their stress levels are escalating. Further, flying-foxes in a particular area can become accustomed to their own team thus minimising disturbance and extra stress. It is also intended to ensure that the majority of the flying-foxes are receiving appropriate attention in a controlled manner.

First response – spraying

Spraying the flying-foxes is designed to provide three things:

- Immediate cooling of individual animals,
- Water for drinking (flying-foxes drink by lapping water off the fur), and,
- Dampening the understory to increase humidity.

In some colonies large volume spraying of the campsite may be possible with water tankers. This is the best solution as it waters the bats, drenches the understory, and can be started a little earlier than hand spraying.

For manual spraying each team should be assigned a water sprayer and start spraying as soon as the flying foxes can be approached without disturbance.

Second response - removal and on-site rehydration

The on-site triage site must be separated from the noise and movement of the staging area. Only triage personnel are permitted in this area.

Flying-foxes on the ground and not responding to spraying, or otherwise in extreme heat stress or injury should be removed to the on-site triage area for assessment and possible treatment.

If possible they should be treated and returned to the exact place they were found. This is critical if babies are to reunite with their mothers. The ability to treat in the field will depend on the local conditions and must be decided by the Colony Controller in consultation with the senior flying-fox rehabilitators and the Flying-fox Controller.

Flying-foxes need to come into care if they need on-going treatment for injuries or are suffering extreme heat exposure.

Third response – removal to off-site triage and care

Flying-foxes needing to come into care must be transported as soon as possible to the off-site triage centre. Only triage personnel should be permitted at the centre until the Triage Controller calls transporters and / or rehabilitators to transport the individual flying-foxes.

Non-heat Stress

NB fire and flood situations, in particular, have general NATF and SES/RFS parent protocols which must be followed. This protocol comes into effect once the area has been cleared for entry.

On-site

The on-site triage site must be separated from the noise and movement of any staging area. Only triage personnel are permitted in this area.

NB the exact conditions for removal of flying-foxes from the colony will be determined by the Flying-fox Controller based on the actual situation as reported by the Colony Controller. What is described here is a general guide only.

Flying-foxes on the ground or hanging low and not responding to humans, should be removed to the on-site triage area for assessment and possible treatment.

If possible they should be treated and returned to the exact place they were found. This is critical if babies are to reunite with their mothers. The ability to treat in the field will depend on the local conditions and must be decided by the Colony Controller in consultation with the senior flying-fox rehabilitators on the ground and the Flying-fox Controller.

Flying-foxes need to come into care if they need on-going treatment for injuries, their colony was burnt (danger from hot trees and falling trees / limbs) or is still under flood or they are suffering extreme heat or cold exposure.

Off-site

Flying-foxes needing to come into care must be transported as soon as possible to the off-site triage centre. Only triage personnel should be permitted at the centre until the Triage Controller calls for transporters and / or rehabilitators to take the individual flying-foxes.

4 Procedure Details

4.1 Team Clothes

There are standards for dress in a disaster (as per the NATF protocol) and these should, in general, be followed. There are some modifications required. Flying-foxes have colour vision and respond as humans do. Hi-vis vests cannot be worn when approaching flying foxes and personal clothes should be in neutral tones.

4.2 Approaching and Spraying

The aim is to assist the flying-foxes. It WILL NOT assist them to force them into flight or start a panic. Remember that coming down low is not natural and the flying-foxes are aware of, and stressed by, their increased vulnerability to predators (including humans).

Keep your distance if

- a flying-fox is looking at you very alertly,
- they are above your head,
- they start scrambling as you approach.

Tanker

Where a tanker is available then spraying should be done by the time the flying-foxes are starting to descend the trunks – over 38 degrees and by 40 degrees and repeated as needed. In reality it will depend on the availability of the tanker. Earlier spraying will still be of significant advantage because it will raise hydration levels of flying-foxes and provide cooling of the understorey.

The water spray is aimed above the colony to bring a mist or very light rain effect down onto the flying-foxes. This enables them to lick water from their fur to drink, cools their bodies and cools the campsite (also raising the humidity).

It must be noted that tankers which have carried treated water cannot be used.

By Hand

Where hand spraying is used then it is not possible until the flying-foxes have come down close to ground at around 40 degrees. It may not be possible until they are sufficiently effected by the heat to ignore the presence of humans. In general this will be at temperatures over 42 degrees and the flying-foxes are now in a critical state and dying.

Care must be taken with the temperature of the water. The flying-foxes are extremely over-heated and the sudden application of cold water will send them into shock and kill them. The ambient air temperature is probably a good indicator of a suitable temperature. Keeping the storage containers in the sun will assist but they must be monitored to ensure that they do not over-heat. If the water source is from a tap to the normal water supply then it will be too cold. It should be decanted into holding containers and allowed to warm before use. NB water directed in a mist above the canopy is not such an issue although chilled water is still to be avoided.

The teams should always be carrying the sprayers. Some low down clumps may, even early on in the day, accept a spray from a distance without becoming agitated, particularly if they have become accustomed to the team. If a gentle spray (not a high pressure jet) is directed onto the flying-foxes as they are approached they may start licking and not take any further notice of the approach. Do NOT approach any closer than needed. A small amount of water delivered, without agitating the animal, will be more effective than more water but with an increase in stress. Flying-foxes learn quickly. If they associate the arrival of the team with a small drink then they will accept the team more readily next time. If the team frightens them they will remain wary and agitated for the entire day.

Once started, the frequency of watering will depend on the local conditions and will need to be maintained until the flying-foxes move back up the trees.

4.3 Removal

Flying-foxes should only be removed when:

- they are not responding to the in-field re-hydration,
- they are injured, or,

- a live baby is found on a dead mother.

When flying-foxes are removed the aim still remains to return them to the colony, therefore, the exact site (i.e. tree) must be identifiable and associated with the flying-fox being removed. This is particularly critical for babies as the chances are high that the mother will survive and therefore the baby can be re-united.

Each tree or log must be given a unique tag and each flying-fox removed must be identified by that tag.

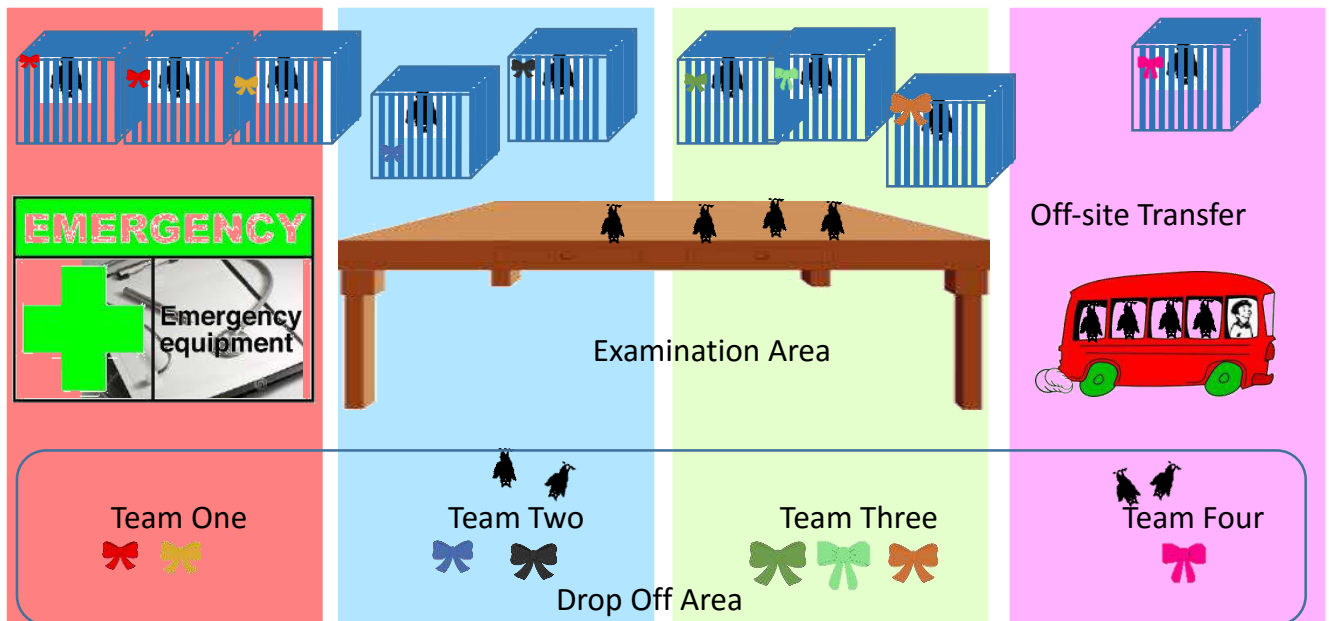
4.4 Triage On-Site

The only people permitted in the on-site triage area are the Triage Team. Colony Teams only drop off or, when called, pick up, they do not stay. Transporters are only permitted at the Triage site when called to collect flying-foxes.

When flying-foxes are removed to the on-site triage centre the aim still remains to return them to the colony later in the day. It is, therefore, critical that the tree tag indicating their origin remains with them.

It is advisable that the area holding flying-foxes in care should be divided into sections mirroring the Colony Team Structure. In the diagram below there are 4 teams. Team 1 has removed flying-foxes from two trees (using red and yellow tags), team 2 from two trees

(using blue and black tags), team three from three trees (using green and brown tags) and team 4 from one tree (using pink tags).



The front of the triage area is for drop off of removed flying foxes. Each team drops off into their appointed area. Individual flying-foxes can be tagged with the colour of their tree and placed in a container in the appropriate area. When numbers escalate then the removed flying-foxes can be grouped in a tagged cage in the assigned area. It is the responsibility of the Colony Teams to ensure that identification is clear. It is the responsibility of the triage team to maintain the identification of each animal as it passes through examination and into the holding area at the back of the triage site or onto transport to the off-site triage area.

4.4.1 Assessment

Each flying-fox must be assessed on arrival and at regular intervals. Ideally one person is dedicated to assessing on arrival and one person is dedicated to ongoing monitoring – this will depend on the number of animals coming in and the size of the triage team. Ideally each flying-fox is given a treatment sheet. In practice this may be a sheet per cage. Whichever is used every action must be recorded on the sheet – time they arrived, time they were assessed, time given fluids, change of behaviour and so on.

NOTES:

1. the first triage has been done in the field by the fact that a team was able to approach and collect the animal, i.e. they will be arriving at a level of Critical or Emergency,
2. the levels refer to the treatment approach for the heat stress event within the on-site triage site. They do not, necessarily, correlate to the assessment for removal to the off-site triage centre.

Level Critical –Treat immediately if numbers permit: extremely hot and dehydrated, unconscious. Unfortunately prognosis is not good even if treated immediately and if resources are limited then level “Emergency” should be given preference. Once treated send to the off-site centre.

Level Emergency – Treat within 15 minutes: very hot and/or extremely dehydrated, lethargic or semi-conscious. Unable to hang even if an adult. This group are likely saveable if treated quickly. Will need non-oral rehydration and ongoing cooling and hydration. Will need initial support on a mumma or hammock.

Level Urgent – Treat within 30 minutes: hot, dehydrated, may be hanging but not in a normal manner. May take oral fluids but may not. May need support to hang. Unlikely to have been brought in at this stage unless taken from a dead mother. More likely to be a “in recovery” stage and requiring assessment (and probably cooling) every 30 minutes.

Level Semi-urgent - Treat within 60 minutes: warm / thirsty, able to hang if an adult. Able to take oral fluids. This should be an “in recovery” stage. Any adult in this stage would not be catchable by a Colony Team.

Level Returnable – ready for release attempt when weather cools. Hanging normally, cool, hydrated, not more than minor injuries.

Any animal with moderate or severe injuries must be sent to the off-site triage centre. Any baby taken from a dead mother must be sent to the off-site triage centre. If an assessment of the dead indicates a high level of lactating females then transfer of all babies must be considered.

4.4.2 Actions

The first action after assessment is to cool the flying-foxes (should be started prior to or in parallel with rehydration). This needs to be done slowly – not placing them in a chilled room or the blast of an air-conditioner. The cooling method will depend on the condition on the site on the day. Suggestions are:

- if power is available then a fan blowing through a wet cloth would be ideal,

- placing the flying-foxes on cool damp cloths is suitable. Even adults are likely to remain on a “mumma” until cool.
- covering with a damp cloth: care needs to be taken with covers! They may be necessary to keep the flying-foxes still and, if wet, may help in the cooling process BUT, once dry, they create an oven. The covering cloths must be kept wet!
- misting with water (covering cloths will help keep the animals calm while misting).
- adults who can hang can be misted through the cage or the cage cover wet.

The second action is to re-hydrate. It is highly likely that flying-foxes in the triage area cannot or will not take oral fluids. At a minimum sub-cutaneous fluid will need to be given. Fluids are delivered by weight – up to 10 % of the body weight in fluid volume. The amount of fluid being given, the type of fluid and the time of the next application, need to be tracked per flying-fox – see Appendices for appropriate forms. As a rule of thumb; any flying-fox needing intra-peritoneal or intra-venous fluid should be removed to the off-site triage area.

Thirdly the flying-foxes need to be kept cool and re-hydration continued throughout the day. Where numbers do not permit individual tracking of fluids then tracking can be done on a per cage basis. At a minimum every cage (or individual flying-fox) needs to be monitored every half hour.

Recovered flying-foxes can normally be returned to their point of origin prior to dark and after the temperature drops. If the flying-foxes are young then the analysis of the dead must be carried out to check on the likelihood of the lactating females being survivors. The areas must be thoroughly checked over the next two days, particularly to ensure that all young have successfully re-united with their mothers.

4.5 Triage Off-Site

The only people permitted in the off-site triage area are the Off-site Triage Team. Transporters are only permitted at a Triage site when delivering flying-foxes or when called to collect flying-foxes.

The off-site triage area is to assess and treat flying-foxes deemed to be non-returnable, or in need of more treatment, by the on-site triage team.

The identification of each flying-fox must remain intact:

1. In case further examination reveals that the flying-fox may be returned,
2. Tracking of flying-foxes for post disaster analysis.

The basic layout of the centre should mirror the layout of the on-site triage centre, except that, where possible, processed injured adults and processed babies should be kept in rooms separate from each other and the assessment and traffic areas. This will minimise disturbance of traumatised adults (particularly lactating females) by human movements or crying babies.

As with the on-site process the first priority is to cool and rehydrate the flying-foxes, particularly as transport may have had a negative impact. The injury must be assessed and treated and babies fed.

Procedure:

1. Individual identification

Thumb rings and nail polish in combination will provide a large variety of identification. Colour identification charts are available to assist - Nail Polish Indicator Sheet.pub.

Babies will be wrapped and therefore toes and thumbs not easily seen. A sticky label attached to their outer wrap will assist a quick identification and can also be marked (e.g. ticked) to indicate that they have been fed, assessed etc. as appropriate.

Each flying-fox must have an individual record sheet (see section 8.1) from this point forward, which must be attached to their cage/box/...,

2. Assess hydration and exposure (and record assessment on sheet),
3. Assess condition and age - weight and forearm measurements; injury status (and record assessment on sheet),
4. Treat (and record actions on sheet),
5. Feed babies (and record on sheet).
6. When ready then allocate flying-foxes to rehabilitators as per directions from Coordinators and transport on ASAP.

4.6 Transport

Flying-foxes need to be transported in a temperature controlled environment. Young can be wrapped on a mumma and placed in a box or rescue basket depending on the number to be transported. Debilitated adults can also be wrapped but will need an enclosed cage.

For short distances (less than half an hour) this will be sufficient. For longer distances (up to several hours) breaks will be required to monitor the heat levels and general status of the flying-foxes. Small hand sprays of water can be used to cool flying-foxes and provide minimal hydration. Major trips (more than a couple of hours) will need special planning to provide fluid, food and toileting for the flying-foxes.

A vaccinated person as transporter is preferred as even on a short trip a baby may escape and start clambering around the car, or a break-down may turn a 15 minute trip into several hours. For longer trips it is mandatory.

4.7 Summary Table of Activities

Activity	Personnel	Responsible	Timing
Colony Checking	Monitor	Flying-fox Controller	As per action level
Creating and updating colony charts and maps	Monitor	Flying-fox Controller	Early Spring and Autumn. Prior to a suspected heat event
Set-up area determinations		Colony Controller in Consultation with the Disaster Coordinator	Level One

Spraying on-site	Colony Teams	Colony Controller	As required
Triage Area	On-site Triage Team	Head of On-site Triage Team	Level One
Support Area	NATF Disaster Team	Disaster Coordinator	Level One
Media Liaison	Disaster Coordinator	Disaster Coordinator	As required
External Communications (other than external rehabilitators)	Disaster Coordinator	Disaster Coordinator	As required
Removing flying-foxes from the camp to treatment	Colony Teams	Flying-fox Controller in consultation with the Colony Controller	When status is critical
Assessment and treatment on-site	On-site Triage Team	Head of On-site Triage Team	As required
Support to Team Personnel	NATF Disaster Team	Disaster Coordinator	Level One
Off-site treatment	Off-site Triage Team	Flying-fox Controller	As required
Transport	Transporters	Colony Controller from colony site Flying-fox Controller from off-site area	As required
Allocation to rehabilitators	Flying-fox Controller	Flying-fox Coordinators	After off-site assessment has determined the need

5 Personnel

5.1 NATF Disaster Coordinator and Disaster Team

In general the NATF Disaster Coordinator is responsible for the normal disaster coordination activities with the exception of those specifically taken on by the Flying-fox Controller. The Flying-fox Controller will be responsible for issues involving flying-fox assessment and the activities of vaccinated team members.

Specifically the Disaster Coordinator or delegate will be responsible for the management of the staging area, the care of all volunteers, the directing of non-vaccinated volunteers, the directing of vaccinated volunteers - in consultation the Flying-fox Controller and, where appropriate, the on-site senior flying-fox rehabilitators.

The Disaster Coordinator is also responsible for arranging grief counselling.

5.2 Flying-fox Controller

This person is called into action by the Disaster Coordinator, or a Monitor detecting a late level 2 or imminent level 1 heat stress action point. The Flying-fox Controller reports to the NATF Disaster Coordinator (or delegate).

The Flying-fox Controller is responsible for the overall management planning and preparation and the “on the day” control of all flying-fox related issues such as:

- Determining when to enter a colony and when to remove flying-foxes,
- Team creation,
- Triage set-up and practices,
- Transport of flying-foxes,
- Contact with external flying-fox contacts as needed.

5.3 Monitor

A Monitor is a, preferably vaccinated, member of NATF (or other related group) who is prepared to “look after” a local colony. The Monitor reports to the NATF Disaster Coordinator and the Flying-fox Controller.

This person needs to be familiar with the local colony throughout the year. They are responsible for maintaining maps of the main features of the campsites and the location of the colony within the campsite (Level 3 alert). During spring or potential storm times they need to be watching the weather forecast for their area and providing that information to the Flying-fox Controller as required.

The Monitor closely observes the colony within the campsite several times per day during a Level 2 alert. They must notify the NATF Disaster Coordinator and the Flying-fox Controller as conditions for their colony approach a level 1 alert. For non heat stress incidents they notify the NATF Disaster Coordinator and the Flying-fox Controller as soon as a level one condition occurs.

They may or may not form part of the Colony teams. They must however provide the initial information and the first walk-through for the Colony teams.

A non-vaccinated person may act as a temporary Monitor when all vaccinated people are required elsewhere. They may not enter the colony (the area of the campsite actually containing the flying-foxes) or handle any flying-foxes. If flying-foxes are on the ground, in-need of rescue, a vaccinated person must be called.

5.4 Colony Coordinator

The Colony Coordinator reports, initially, to the Flying fox Controller for the setup of the teams, the on-site triage area and the overall plan of approach. Once on-site they report to the NATF Disaster Co-ordinator (or delegate). At all times they report to the Flying-fox Controller on issues / decisions affecting flying-fox handling and care. This person ensures that the teams and activities as initially determined by the Flying fox Controller are managed appropriately. Conditions on the ground can vary and change from hour to hour and as such the Colony Coordinator is responsible for directing the teams throughout the day to appropriate activities e.g. spraying versus triage versus transport. Where the Colony Coordinator is not an experienced flying-fox person then these changes to the initial plan should be done in consultation with the senior flying-fox rehabilitators on the ground. If an agreement cannot be reached the Flying-fox Controller will decide.

5.5 Vaccinated Teams

All vaccinated teams report to the Colony Coordinator when on-site. When off-site they report directly to the Flying-fox Controller. Teams of vaccinated people will be set up to carry out the following tasks:

- Monitoring a specific area of the colony,
- Spraying heat stressed flying foxes within the nominated area,
- Removing severely heat stressed (or otherwise injured) flying foxes to the triage centre,
- Assessing and treating within the on-site triage centre,
- Assessing and treating within the off-site triage centre,
- Transporting.

5.5.1 Colony Team

A colony team is given a specific area of the campsite and the responsibility within that area. Generally speaking, in a heat stress event, the Colony Team assigned to a specific area is the team who monitors, sprays and selects flying-foxes for removal to the triage centre. Where a Colony Team is inexperienced in the assessment then they may make the initial assessment and call on a senior assessor to make a final selection. NB it is not necessary that the Colony Team moves the stressed flying-foxes to the triage centre. Depending on available personnel they may call for a carrier.

It is preferable that a Colony Team remains on-site for the duration of the disaster particularly a heat stress event. This places a high demand on the team. As such a Colony Team should be rested between spraying and monitoring events and not asked/allowed to carry out other duties. Where it is not practical for a team to remain on site for the entire time then there must be overlap of personnel for at least two monitoring or spraying runs. This is to ensure that the incoming team is aware of the position and condition of flying-foxes within their designated area and of the identification of flying-foxes removed to the triage site which must be returned to the colony when possible.

A Colony Team should be between 2 and 5 people depending on resources, the area to be covered and the number of flying-foxes effected within the area.

5.5.2 On-site Triage Team

The prime responsibility of this team is to assess and treat flying -foxes too critically affected to remain in the colony. The primary aim of the team is to return flying foxes to the colony as soon as possible and sufficiently treated to survive.

The initial composition and activities of the Triage Team is the responsibility of the Flying-fox Controller. But once the disaster has occurred (the drop has begun in heat stress events) the Colony Coordinator will be responsible for the ongoing management and composition of the team.

Initially only one person may be required in the triage area in a heat stress event as the aim of the Colony Teams is to treat in the field. Once a full drop is underway, or other disaster occurred, then injured and severely affected flying-foxes will have to be pulled from the colony for more intensive treatment. At that point more people will be required on the Triage Team dependent on the number of flying-foxes coming out of the colony.

5.5.3 Off-site Triage Team

The prime responsibility of this team is to assess, treat and distribute flying foxes which need to come into care. The primary aim of the team is to save severely affected or injured flying-foxes and get them into care as soon as possible.

The Off-site Triage Team is the responsibility of, and reports to, the Flying-fox Controller.

A minimum of two people will be required once this triage team is activated. Flying-foxes reaching this site will either be mass numbers of young or severely injured adults. As such the people on this team will need to be experienced. As this team will not be active until some hours into the disaster, and will be the physical point of contact for many of the helpers it is possible that the head of this Triage Team can be the Flying-fox Controller.

5.5.4 Transporters

It is preferable that Transporters are, wherever possible, vaccinated. It is critical to have a vaccinated person present in a car for journeys over two hours. Transport between a Colony site and the off-site triage centre, which should be less than 20 minutes, can be by non-vaccinated persons.

Transporters between colony and off-site triage report to the Colony Coordinator. Transporters between the off-site triage centre and the rehabilitator (including rehabilitators picking up directly) report to the Flying-fox Controller.

Determination of the destination of flying-foxes going into care is the responsibility of the Flying-fox Coordinators (that is the Flying-fox Baby Coordinator for babies and the Flying-fox Adult Coordinator for adults). Implementing this determination is the responsibility of the Flying-fox Controller.

5.6 Non-vaccinated teams

Non-vaccinated teams will be required to support the vaccinated people and to carry out all the usual disaster response activities. These people and their activities are the responsibility of the NATF Disaster Coordinator and the normal NATF Disaster Team as per NATF policies.

6 Dead

The numbers of dead can be overwhelming for rehabilitators and the living tend to be the acute concern on the day. It is critical to know the composition of the dead prior to returning young. Knowing this composition early on will help guide the return of young, e.g. if the dead are young or males then the mothers have survived and so the young can be returned to the colony in the evening.

A great deal of information can be gained from the dead. This will help with future planning for these events and to understand what is happening within the colony.

The dead need to be removed from the colony to prevent scavengers and disease becoming a secondary disaster. Each individual will need to be examined prior to assuming death – even if removed from the base of a pile of dead!

The following information needs to be gathered from each body:

- Gender,
- Age category
- Lactation status of females, and,
- If possible:
 - forearm length, and,
 - weight.

Gloved, non-vaccinated teams can be used to remove and process bodies. They may only enter a campsite under the direction of the Colony Controller and may need to be accompanied by a vaccinated helper whilst in the colony. Confirmed dead can be removed from the site for processing once age/gender is established¹.

Heat stress events can result in one of the most confronting mass die-off scenes ever witnessed. Due to the requirement to use vaccinated helpers in the campsite, the people receiving the brunt of the effect are also the people most emotionally involved. In the case of major death then grief counselling is recommended for the Colony and Triage Teams.

¹ To determine if mothers have survived and hence babies can be returned
NATF flying-fox disaster protocol.docx

7 Appendix A Status of heat effected flying-foxes and response:

1. Hanging wrapped, little movement, mostly resting – normal condition:

- no action required
- level 3 or 2



2. Panting, flapping, licking but still up high - normal heat response:

- no action required
- level 2 or 1a

3. Moving towards the tree trunks, moving down the trunks, or, clumping:

- response crews assembled on site, assigned a particular area,
- begin regular patrols of the area in preparation for prophylactic spraying,
- change to action Level 1B.



4. Clumping, within reach, not responding to presence of humans:

- response crews begin spraying frequently as indicated by the conditions,
- see Action Level 1B.

5. On the ground, unresponsive, or, injured:

- remove to the on-site triage area,
- See Action Level 1b



8 Appendix B Care Sheets

The triage care sheets are for use in the triage centres. Once a flying-fox is taken into full care the triage sheet should be added to the normal care sheets.

Where a per cage sheet is used and one or more flying-foxes are then removed to individual care then the relevant information (header sections and any actions pertinent to the individual) should be transferred to an individual triage sheet.

The colony, date and colony team information can be completed prior to the removal of flying-foxes into care.

The tree / area id is the tag used – and can be a description (red tag) or a sample (spray of paint). This information will be used to return flying-foxes in the evening and for data analysis of problem areas and processes used during the de-brief.

The incoming status is a brief comment on the reason for coming in e.g. under a log, unresponsive, fell from a height, top of 50 bodies, etc.

The outcome is the final action: returned to site, taken into care, died.

The time and action fields are to track treatment of the flying-foxes to ensure they receive appropriate treatment throughout the day and for debriefing after (analysis of treatment to outcome). The first entry should be the time of arrival at the triage site. On the individual forms the action will refer to the individual. The action may be: examined (and the results), observed (and the results including - no issue), oral fluids, dressed wound, transferred to off-site, etc. On the cage forms the action field must record all additions to and removal from the cage.

8.1 Triage Care Sheet per Flying-fox

Colony:		Date:	Colony Team:
Tree / Area Id			
Incoming Status			
Outcome			
Time	Action / Comment		

8.2 Triage Care Sheet per Cage

Colony:		Date:	Colony Team:
Tree / Area Id			
Outcome			
Time	Action / Comment		

9 Appendix C Mortality Charts

Ideally each body is checked for age, gender and, if female, lactating status and then weighed and the forearm measured. This information is recorded in the table under first preference and the body placed in a body bag.

If this is not possible then the body can be checked for gender and age and ticked off on the tables under second preference and the body placed in a body bag.

When the bag is full it should be tied off and marked for disposal with a luggage tag.

First Preference

One row per flying-fox.

[illegible]

Second Preference

Use a mark system in each cell.

Males	Adult	Young	Subadult

Females	Adult	Young	Subadult

10 Appendix D Colony Charts

Colony charts provide the information required for each colony. The template should be completed by the colony monitor and used to describe and update colony information.

Name	Understory	Protection	Availability of water	Mitigating factors	Exacerbating factors	Access for teams	Access for bulk spraying	Monitor	Staging area	On-site triage site	Off-site triage site	Special Action Points
Blackall's Park												
Blackbutt												
Carrington												
East Cessnock	Thick, over a watercourse (not necessarily free water)	Low-lying, thick scrubby trees protect from wind	None	Not exposed Some damp areas in thick shade	Small area, negative neighbours	Moderate to easy	Moderate to easy dependent on exact position of colony within campsite. None arranged.	Judith Hopper Kelly Bradley	Crown land open ground off Hallam Street or empty block off Long Street	Crown land open ground off Hallam Street or empty block off Long Street	20A Fourth Street Weston (Bev Marsh)	Level 2: after school breakup Level 1a very high 30's unless disturbance noted.
Glen William												
Maitland												
Medowie												
Raymond Terrace												
Tocal												
Toronto												

EXAMPLE ONLY – See Disaster Coordinator for current sheet

11 Appendix E Contact Form

This form is used by the Flying-fox Controller to keep track of all incoming and outgoing messages. This helps to ensure that information is not forgotten. It is a running sheet of all contacts.

Time	Person/Contact Type	Points Covered (incl any needed call backs)

12 Appendix F Equipment and Use

12.1 Water

Care must be taken with the temperature of the water. It must be tepid \NOT cold.

Tap water should be decanted into holding containers and allowed to warm before adding to sprayers. NB water direct in a mist above the canopy is not such an issue although chilled water is still to be avoided.

Keeping the storage containers in the sun will assist but they must be monitored to ensure that they do not over-heat.

Water in sprayers should be kept in the shade and tested before applying. The smaller containers can heat to burning temperature.

Hand sprays can be used in the triage site to cool the flying-foxes.

Item	Alternative	Use	Necessity	Kit Status
Water		Cooling and rehydration	A	
Storage		For filling sprays and cage bowls	A	
Back Sprays	Hand Sprays (not recommended as not very practical)	Spraying the colony	A	
Hand Sprays		Spraying the triage flying-foxes and cages	A	

12.2 Tagging

Each tree or log must be given a unique tag and each flying-fox removed must be identified by that tag. Coloured ties matched to coloured nail polish / plastic rings / collars are required.

Stick-on labels are required for attaching to wraps for each baby (used to colour code and indicated feeding).

Cages should also be tagged with the colour of the tree tag.

Areas within the triage site should also be tagged.

Item	Alternative	Use	Necessity	Kit Status
Coloured tapes	Spray paint, Luggage tags	Tagging trees, cages, triage areas	A	
Nail polish	Thumb rings and pencils/highlighters	Tagging animals and forms	A	
Coloured thumb bands		Tagging animals		
Strong sticky labels		Used to mark baby wraps as id and to track rehydration/feeding in acute triage	A	

12.3 Triage Kits

Treatment

Item	Alternative	Use	Necessity	Kit Status
Bags of sterile normal saline – this is the safest	Hartman's fluid (sodium lactate) is acceptable	Subcutaneous rehydration Also suitable for intra-peritoneal or intravenous	A	
21G long needles		for drawing up fluid from bags	A	
27G short needles		for fluid delivery to flying-fox	A	
27G butterfly cannulas	Short needles	these make fluid delivery much easier but they are significantly more expensive	C	
Syringes – sterile - 10ml		Injectable rehydration	A	
Syringes – sterile - 50 ml		Injectable adult rehydration	A	
Syringes ² – non-sterile - 10ml	Any size	Oral rehydration	A	
Bottles of normal saline (made up)	plain water acceptable	for oral rehydration	A	
Macadamia oil	Any vegetable oil	Wound treatment including sunburn and insect bites.	A	
Unprocessed honey and tegaderm dressings	Any polyurethane dressing	Wound treatment	B – colony A – Off site	
Forms		Triage care sheet	A	
Stethoscope		Checking for life		

² Larger syringes are harder to control, can't double for baby use with a teat but save time in re-filling

Baby Care

Item	Alternative	Use	Necessity	Kit Status
Mumma roll		Baby safety	A	
Mumma roll wrap	Don't use	Keep the roll clean for repeated use	B	
Baby wrap		Baby safety	A	
White foam boxes (preferably lined)	Any large box	Baby containment	A	
Teats		Rehydration / Feeding	A	
Syringes ³ – non-sterile - 10ml	Glass bottles – 25 ml	Rehydration / Feeding	A	
Glass bottles – 25 ml	Syringes – non-sterile - 10ml	Rehydration / Feeding	A	
S26 2 original	Any human baby milk (not the “gold” protein enriched version) Full cream milk	Feeding	B – colony A – Off site	

Adult Care

Item	Alternative	Use	Necessity	Kit Status
Cages	Cardboard box but of limited use	Containment	A	
Towels – large – small	To cover cages To wrap adults for examination	Containment	A	
D cups	Any container to hold water on the side of the cage	Rehydration	A	
Luggage tags		For id and instructions (e.g. ready for return)	B	

³ Syringes give greater control but require more effort to use than bottles. Bottles are easier but in some cases a syringe will be mandatory.

12.4Misc

Body bags

Luggage tags for body bag.