

Butterfly House, Cumberland House Natural History Museum

Disaster Management Plan

Introduction

Section 1A (viii) of the zoo license specifies the conservation measures that zoos, and small specialist collections such as aquaria and butterfly houses, are required to undertake with respect to preventing the escape of animals. This requires putting in place measures to be taken in the event of any escape or unauthorised release of animals.

As a holder of a zoo license periodic inspections may be made to check measures for prevention of the escape of animals, in this case butterflies

Ethics of keeping exotic butterflies

Portsmouth Museums and Portsmouth City Council have a responsibility and duty of care that we owe to the butterflies in our care. These include:

1. Ensuring that our butterflies in all stages of their lifecycle (egg, caterpillar, pupa and adult) are cared for humanely regarding food, water, hygiene, appropriate temperature and humidity.
2. Compliance with rules and regulations regarding the breeding, transport, and display of butterflies.
3. The rearing of butterflies in the butterfly must not endanger any local species by introducing exotic species to local environment.
4. To educate the public about our butterflies and their natural habitats.

Where butterflies are sourced

Our butterflies are received in the pupae stage which are reared in a puparium enabling members of the public to watch them emerge as butterflies. The butterflies are released once their wings have hardened after emerging.

The butterfly pupae are purchased from Stratford Butterfly Farm who have suppliers in Belize, El Salvador, Costa Rica, Ecuador and Suriname.

The El Salvadorian supplier is right next to a nature reserve and manages his land in line with them, he is part of a buffer zone to the reserve. One of the Costa Rican suppliers has their own nature reserve and put all profits into expanding and maintaining that. The other Costa Rican, Ecuadorian and Suriname suppliers are also part of IABES (International Association of Butterfly Exhibitors and Suppliers) and run their operations on ethical and sustainable principals.

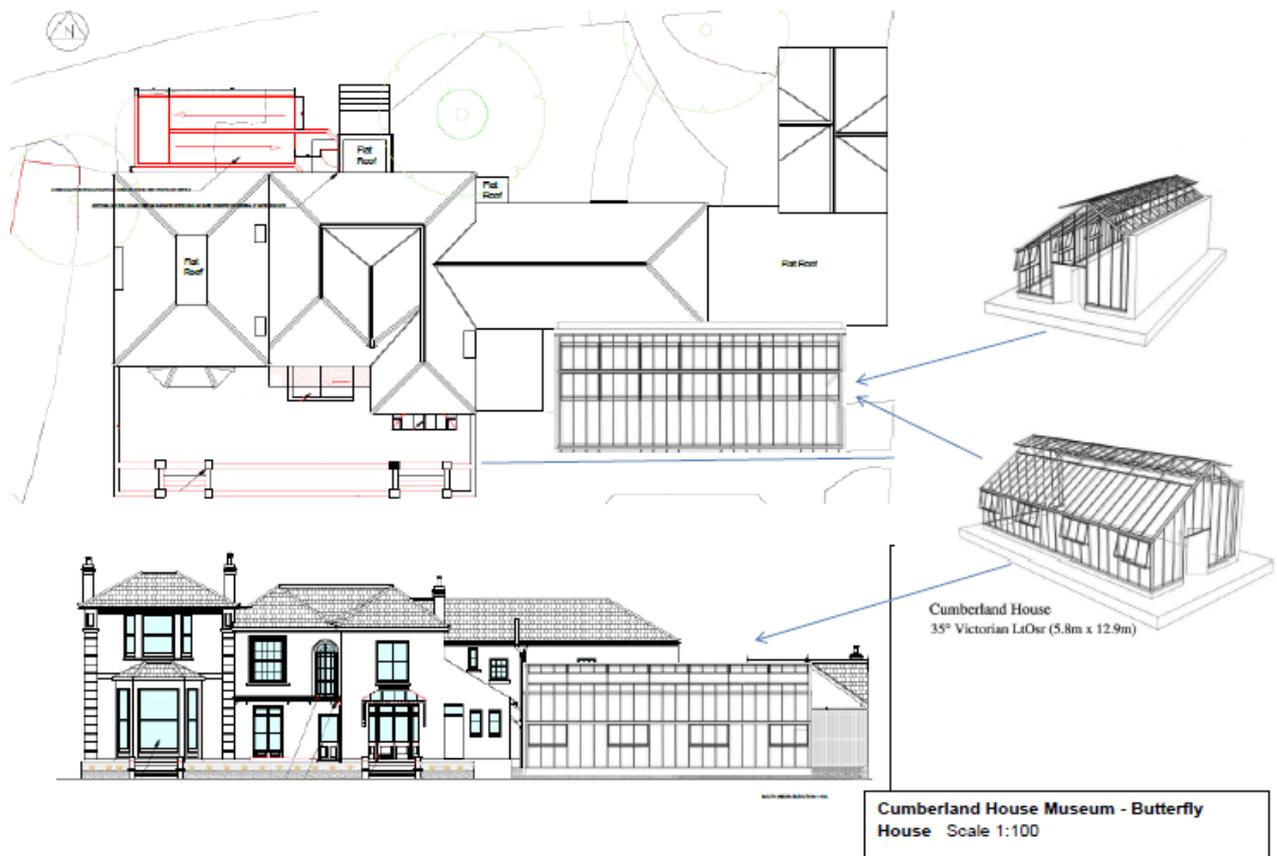
None of the butterflies are taken from the wild which helps provide a sustainable way for the suppliers to make a living.

Using responsible breeders and suppliers helps to minimise diseases and parasites and is why alternative and often cheaper suppliers from other countries are not used to bulk up numbers of butterflies flying at one time.

Location of the butterfly house within the museum

The location of the butterfly house within Cumberland House is defined as the greenhouse housing the butterflies, the foyer outside of the greenhouse and the laboratory where pupae are prepared for the puparium and where food is prepared.

The purpose-built butterfly house consists of a single space green house and pupae are accommodated in a separate 'hatching cage' within this space.



Disaster planning

This document acknowledges the risks outlined in the museum risk assessment and mainly covers disaster planning in respect of butterfly welfare.

Potential risks may include all or some of the following.

- Escaped butterflies
- Damage to eggs, caterpillar, pupae and butterflies through handling
- Zoonotic diseases and pests
- Too high temperature or humidity levels
- Fire or flooding
- Power / utility outage
- Loss of food plants
- Damage to the glass of the greenhouse

Escaped butterflies

Butterflies very rarely escape beyond the perimeter of the butterfly house although this remains a potential risk. A lone butterfly escape would do little ecological damage although the change in temperature, humidity and the lack of available food plants would limit the life of the insect.

Mass escapes carry the risk of causing local ecological damage.

Butterflies may escape via one of the following routes:

a. Door of butterfly house

The entrance / exit door is made of freezer curtains which prevents butterfly escape but allows visitors to walk through. The door is activated by a push button and remains open for a set amount of time or until a visitor has gone through the curtain. Visitors are encouraged not to linger in this area to prevent the escape of butterflies.

b. Fire door of butterfly house

The fire door is located at the rear of the butterfly house and protected by a freezer curtain. The door is activated by push bars and an alarm is sounded when opened. The main risk is visitors occasionally mistaking the doors as the exit to the butterfly house.

c. Hitch hiking on member of the public

A large mirror has been installed near the door of the butterfly house to help visitors to check themselves for any hitch hiking butterflies. Staff working in the butterfly house also keep an eye on people leaving to ensure that they do not have a butterfly on their person. Staff on Reception also check to ensure that there are no hitch hiking butterflies on museum visitors before they leave the premises.

d. Theft and Activism

Occasionally butterflies or caterpillars are accidentally or purposely removed by visitors. The butterfly house is supervised by a member of staff or a volunteer who can advise visitors that the butterflies would have a limited life outside of the butterfly house and may cause damage to local native populations if released *en masse*.

e. Damage to the glass of the greenhouse

Damage to the glass of the greenhouse can occur through accidental damage, vandalism or storm damage.

The butterfly house is lined with netting, if the net is undamaged butterflies can remain in the greenhouse taking weather conditions into account. If it is raining or the netting is broken, trained staff collect the butterflies to put in the emerging cage and netted container in the laboratory.

If glass is damaged procedures are in place which includes placing a tarpaulin over the greenhouse to prevent loss of butterflies. [Policy for damage to butterfly house roof.pdf](#)

If damage takes place outside of opening house the museum is protected by an alarm system with call out procedures in place.

A net for recapture is stationed just inside the door to enable staff and butterfly house volunteers to catch any escapees.

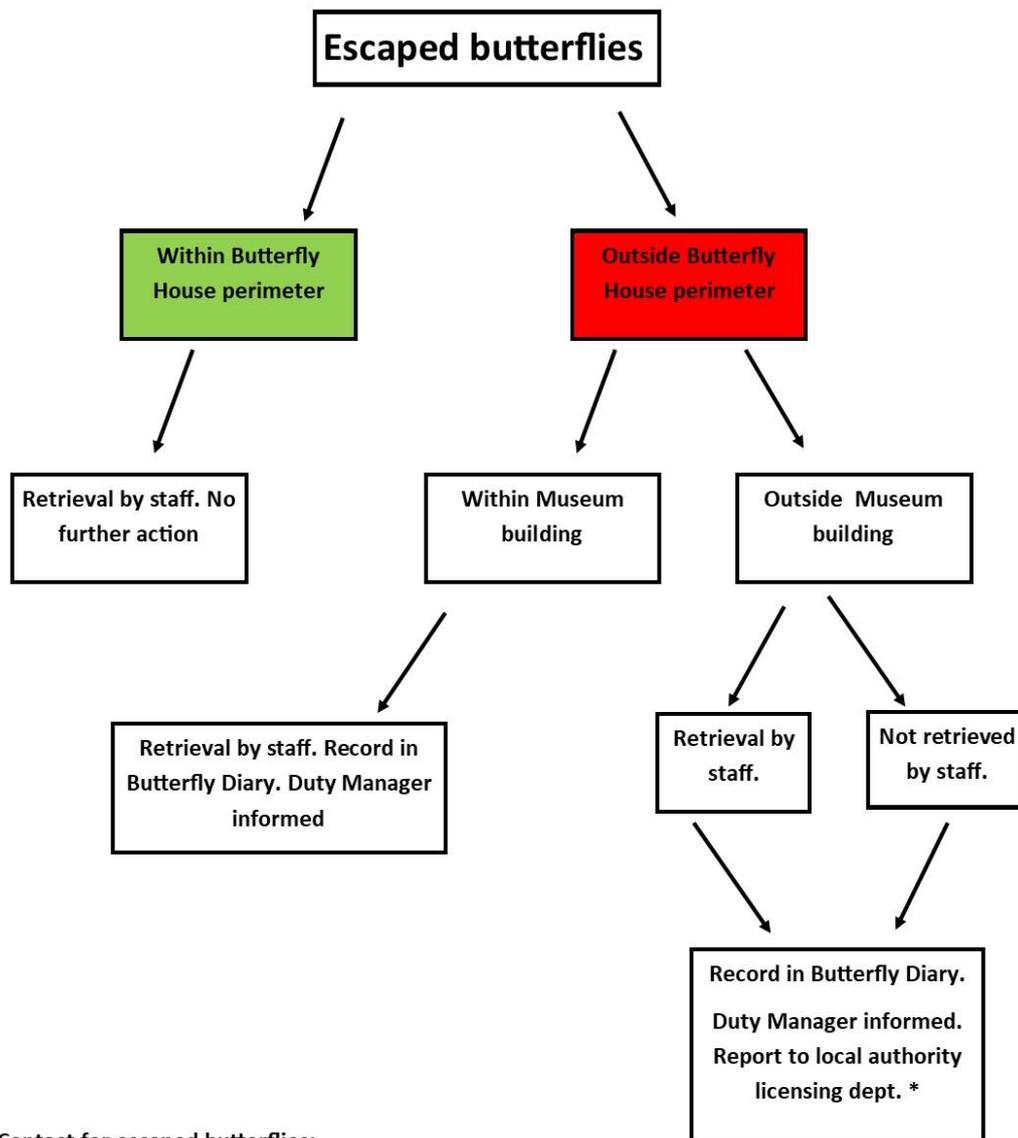
Staff are given appropriate training for escaped butterflies which is logged in the butterfly house H&S folder. Staff are also trained in the correct way to handle butterflies. An escape drill is completed four times a year and logged.

Any escaped butterflies outside of the designated Butterfly house perimeter are logged in the butterfly house diary and the duty manager informed.

If any butterflies have escaped the museum the PCC licencing department need to be advised.

Further information can be found in the [Policy for escaping butterflies r1.pdf](#)

Escaped Butterflies Procedure — Overview



* Contact for escaped butterflies:

Richard Lee

Regulatory Services Manager, Environmental Health,

Civic Offices, Guildhall Square, Portsmouth, Hants. PO1 2AL

Tel: 023 9283 4857

Email: Richard.Lee@Portsmouthcc.gov.uk

Damage to eggs, caterpillar, pupae and butterflies through handling

Staff are trained in how to prepare the pupae prior to being placed in the puparium. Numbers of pupae on each pole are counted before leaving the laboratory and again once in place in the puparium.

Further information can be found in the [Policy for Interacting with butterflies.pdf](#)

Pupae arriving from Stratford Butterflies are never in contact with members of the public but, once released from the puparium, butterflies fly among the plants in the butterfly house, visit the feeding stations and rest on the ground within reach of visitors. Following mating eggs, caterpillars and pupae are also within public reach.

Signs on the outside of the butterfly house and museum staff / volunteers ask visitors not to touch the butterflies and to watch out for butterflies resting on the ground. Visitors are also requested not to touch plants which might host eggs, caterpillars and pupae and are also reminded verbally not to touch.

Procedures for euthanizing poorly formed and damaged butterflies are in place to dispatch specimens as humanely and ethically as possible.

Zoonotic diseases and pests

Each butterfly species supports its own parasites and not all of them are specific to species. Within the butterfly house this is not considered a risk, but it may cause problems if allowed to escape into local environment. Using the same supplier with their approved farmers also enables any potential zoonotic diseases to be kept to a minimum.

Insect pests can affect the plants which offer shade, refuge and a food supply for all stages of the butterfly lifecycle. Parasitic flies and wasps may prevent caterpillars developing to adult stage and birds, mammals, insects and spiders may predate caterpillars and eggs.

The butterfly house is cleaned of cobwebs daily to prevent butterflies being caught in spider webs. The cleaning tools are kept in the butterfly house so that cobwebs can be immediately removed on discovery. Ants are controlled using baited traps.

Plants are monitored for pests. Pests such as whitefly, mealy bug etc are managed using biological controls. Red spider mite are managed by maintaining the relative humidity.

Plants and soil in the butterfly house have a good provenance to ensure that they are chemically free.

Wild birds and squirrels are kept out of the Butterfly house through the use of netting that lines the greenhouse to prevent escape by butterflies.

Cumberland House has a Pest Control Service Agreement in place in respect of rats and mice for the Butterfly House. The premises are checked 8 times per year.

[Cumberland House Pest Control 2019.pdf](#)

The puparium is checked daily for parasites, fungal and bacterial growth and viral black pupae which are removed if present.

Food preparation for the butterflies is in the laboratory which has a designated fridge for food storage of fruit and is away from staff food preparation areas.

The feeding station is cleaned when the fruit is replaced every two days using water. Chemicals are not used in the Butterfly House.

[Policy for feeding butterflies r1.pdf](#)

Fire or Flooding

Cumberland House is in a high to low risk area of flooding although the position of the museum has meant that this has rarely occurred.

<https://www.getthedata.com/flood-map/southsea-po5>

In the unlikely event of flooding trained staff collect the butterflies to put in the emerging cage and netted container in the laboratory so that the Butterfly house can be thoroughly cleaned.

The flight area of the butterfly house is always kept wet to maintain humidity, which considerably reduces the risk of fire.

Too high temperature or humidity levels

Monitors for temperature and humidity are in place in the butterfly house and the puparium.

The puparium is checked several times every day for emerging butterflies and the temperature and humidity levels. The matting on the base of the puparium is checked to ensure that it is damp.

Temperature levels in the puparium should be 28°C and the RH 80%. There are vents to open if levels go above these levels.

Heat Levels in butterfly house - 26 deg C daytime falling to 15 deg C at night.

If very sunny can set heat to 22 deg C to stop hot air being lost through vents.

If very dull boost heat to 27 deg C to encourage activity.

RH Levels in butterfly house - 80%, maintain by watering paths when necessary.

Will fall to 60% with vents open, re-water if plants start to show signs of wilt.

If 100% open vents to let out steam, then close if cold outside.

Members of staff, volunteers and visitors to the butterfly house may also be affected by high temperature and humidity levels leading to disorientation and collapse, the aftermath of which may lead to butterflies being crushed or damaged. Staff and volunteers have a limited amount of time that they can continually spend in the butterfly house. Visitors are advised of the conditions inside the butterfly house before entering and signage in place to warn of high temperature and humidity.

Power / utility outage

The temperature and humidity of the butterfly house is regulated by the automatic opening and closing of window vents, controlled by TomTech Environmental control systems. This on an annual maintenance contract. In the event of breakdown the TomTech provide a response within 24 hours.

In the event of power / utility outage the vents and heating can be controlled manually.

It has been recommended by the butterfly house vet that the system is backed by being put on the local electric's priority reconnection list.

The door to the butterfly house can be operated manually and there is an emergency exit at the east end (opposite end) to the entrance.

Loss of food plants

The plants in the butterfly house provide additional nectar and pollen for some butterflies, many of the plants provide food for growing caterpillars. Plants also provide shade and act as refuge places.

Plants are often stripped of their leaves, especially the citrus and banana plants, through the action of caterpillars feeding on them.

Plants are propagated through taking cuttings and dividing plants. There is a daily watering regime in place.

Banana plants become scorched with too much sun, in these instances the plant is moved to a more shady position.

Some plants, specifically lantana is prone to Botrytis Blight which is caused by excess moisture and overhead watering / high humidity. These plants are regularly checked and pruned to arrest growth which affects the leaves.

New plants and soil introduced to the Butterfly house needs a good provenance to ensure that they are chemically free.

References

Michael Boppré and R.I. Vane-Wright The Butterfly house Industry: Conservation Risks and Education Opportunities. Conservation & Society Vol. 10, No. 3 (2012), pp. 285-303 (19 pages)

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https://www.jstor.org/stable/26393084?seq=15#metadata_info_tab_contents