ENGLISH HERITAGE (EH) GUIDELINE FOR INSECT PEST MANAGEMENT (IPM) IN ENGLISH HERITAGE HISTORIC PROPERTIES.

Contents

1) ENGLISH HERITAGE GUIDELINE FOR INSECT PEST MANAGEMENT

Maintain sites -

Collections are at risk and the buildings may be infested and harbour pests. At particular risk are organic materials such as textiles, costumes, furniture, ephemera, ethnographic collections and timber structures. This Guideline for Insect Pest Management is outlined below.

- It is the responsibility of ALL staff involved with properties to be aware of the threat to objects posed by insects and other pests including rodents and pigeons.

- Appropriate training and support shall be given to staff on insect pest monitoring and pest prevention.

- Appropriate monitoring programmes using Museum traps will be undertaken by appropriate staff with support from the Collections Conservation Team.

- A low level of insect and pest activity appropriate for each property across the site will be tolerated.

- Remedial action will be taken when the pest activity level poses a significant threat to objects or collections.

- Appropriate control measures will be implemented for objects and buildings when necessary.

- Collections entering the site will be checked for insect infestation and treated if necessary.

- All materials and fabrics used for display, education and decorative purposes should be chosen so as not to be food sources for insects and other pests.

- Cleaning will be to a high and agreed level for each property.

- Building maintenance relating to water ingress will be to a high and agreed level for each property.

- All catering and food handling for public, staff and schools on the site must be to an agreed high standard of hygiene to minimise risks from insects, rodents and birds.

- Low hazard or non-toxic methods of control will be used.

- No control treatments should be carried out until the risk from the insect pests is established.

- New buildings or restored historic buildings which are to be used for storage or display purposes must incorporate pest prevention principals at the design stage.

2) INTRODUCTION TO INSECT PEST MANAGEMENT

The aim of Insect Pest Management is to provide practical, safe and cost-effective methods to prevent collections and buildings from being damaged by pests.

The main principles are:

- Monitoring for insect pests, targeting treatment only where it is needed and modifying the environment to discourage insect attack.

- The approach is to look at the whole picture rather than to react to each crisis.

- A well-planned and executed programme will prevent problems occurring and prevent crisis situations.

- Targeted control using safe methods will achieve better results at lower cost than large scale chemical treatments.

- Insect Pest Management must be relevant to the needs of the building, its collection and should use as much local information and expertise as possible and must encourage the participation of all staff.

The key stages are:

- Recognising and identifying priorities for action

- Identifying responsible staff

- Training staff

- Taking action on the high priorities

- Identifying procedures already in place which can be readily included in the programme

- Establishing procedures for implementing Insect Pest Management, forward planning, financing and review.

In order to develop a strategy it is important to understand and recognise some of the key components of successful pest control.

These are:

- Avoiding pests - by keeping pests out
- Preventing pests - by denying them safe haven
- Recognising pests - the main species and the damage they cause
- Assessing the problem - by inspection and trapping
- Solving pest problems - by improving the environment and carrying out appropriate treatment methods
- Reviewing procedures periodically and changing when necessary to improve the strategy.

Training and on-going support will be provided by the Collections Pest Control Manager and the Buildings Conservation and Research Team.

3) WHAT ARE THE PESTS?

The key to avoiding pests is to understand what makes them thrive and increase in numbers. For example, the conditions found in most properties are too dry for the early stages of furniture beetle/woodworm. Active infestation is only found on structural wood or objects where humidity rises above 55%RH. Pests such as silverfish and booklice require damp conditions to breed and can be useful indicators of damp problems. By denying pests food, warmth, humidity and harbourage, we can prevent them becoming established and causing damage.

Details of the major insect pests are given in the English Heritage insect pest poster.

4) OBJECTS AT RISK FROM INSECT ATTACK ON DISPLAY AND IN STORAGE

English Heritage properties have a variety of collections and some are more vulnerable to insect attack than others.

The most likely items to contain sources of food for insects are those which contain animal skins, fur, feathers, hair, parchment, vellum and wool. Silk, linen and cotton can also be attacked by pests particularly when soiled.

Other items containing sapwood, plywood with animal glue, some composite objects containing cellulose, starchy paper and papier-mache are also at risk.

Some materials such as clean cotton or silk are not attacked. Paper is also rarely attacked unless it is dirty and damp. In general, dirty and neglected objects in dark places will be more at risk than those that are clean and in well lit areas.

- New acquisitions and loans are particular sources of risk as they can bring pests into a property

- New or reproduction materials for display can bring pests into a property and can also be a source of food for pests.

5) PESTS IN THE BUILDING ENVIRONMENT.

Insects

Insects such as carpet beetles and clothes moths will be flying around in the summer months and some will gain direct access to the building.

Birds and Rodents

Birds and rodents will also get into buildings, cause damage and increase the risk of insect problems. Many modern buildings have been successfully proofed to prevent the entry of these pests but keeping birds and rodents out of an old and historic building is far more difficult.

Food and shelter

It is not often possible to completely exclude pests from a building and so it is important that they are denied a suitable environment if they do get in. The four key things needed by pests are food and harbourage, warmth and water or humidity.

Because insects are small they may find sufficient food in relatively small areas which may not be immediately obvious. The most common sources of insect problems are:

- Old bird, wasp and bee nests in attics

- Blocked chimneys and fireplaces

- Old heating and ventilation ducts

- Cavity walls and floors

- Unused rooms or cupboards particularly in attics and basements

- Gaps between walls and floors

- Dead spaces behind and under storage cabinets, display cases and plinths

- Dead spaces under and behind storage shelving

- Wool and felt lining on boxes and felt sealing strips on doors

- Old and discarded display material and cases, particularly when covered or lined with wool felt.

Insects will penetrate small cracks and crevices but display and storage furniture can act as a further barrier to pest attack if it is well designed and maintained. Cupboards, cabinets and drawers which may appear to be sound should be inspected because they may have hidden cracks and voids which allow insect access.

Temperature

- Warm temperatures of 20°C and above will encourage insect breeding

- Direct sunlight can cause localised hot-spots even in cool areas and uneven temperatures may result in localised condensation.

Humidity

- Many insects, such as biscuit beetles, will survive at low humidities but some species thrive when it is damper

- Furniture beetle or woodworm will only successfully complete its life cycle when wood is in an environment above 55%RH. It is usually only found infesting wood in basements or attics or objects which have been stored in outbuildings

- Silverfish will only breed rapidly and cause serious problems in conditions of above 70%RH

- Booklice also need higher levels of humidity than is normally found in libraries and archives. They are often found in damp basements or in localised damp areas

- Relative humidity (RH) levels should be measured and monitored.

6) HOW TO FIND INSECTS

Insect monitoring using insect traps is the key component of Insect Pest Management. Traps are placed at strategic points around the house and a record kept of the insects caught.

Traps are used to detect insects and not to control them. Sticky Museum or ‘blunder’ traps work on the principle of the wandering insect blundering into the trap and becoming stuck on the non-toxic adhesive surface.

These are general guidelines:

- Trapping programmes should be designed to be manageable

- Traps should be placed in rooms with the date and location labelled on them as marked on the properties floor plan

- Traps are designed to be placed on the floor and they work best in fireplaces, in corners and wall floor angles rather than in the middle of open areas

- Traps should be checked four times a year in late March, June, September and December

- Traps and pheromone lures must always be replaced at the quarterly trap check unless alternative specification applies (for example case-bearing clothes moth pheromone lures)

- This includes any traps or lure boards which are ‘clear’ of any insects

- Insect pests caught on traps are to be identified and recorded. If the ID is uncertain, keep the trap and get unknown insects checked either by the Collections Pest Control Manager or the Consultant Entomologist

- It is also important to record whether the insect is an adult or a larva

- It is only by recording results over a period of time that a picture will emerge. This is why trapping four times a year can give crucial information

- Plot results on the properties floor plan using the EH designated coloured insect pest symbols

- Visual inspection is still important. Pests found on places such as windowsills should also be recorded on the ‘Collected’ worksheet

- Trap results are analysed every year and used to target preventative and remedial measures.

WARNING: WHEN BATS ARE PRESENT IN A PROPRTY

Sticky Museum or ‘blunder’ traps must **NOT BE USED** in rooms and locations where there is any risk of catching bats. Always consult the Collections Pest Control Manager, or the Consultant Entomologist, if there is any suspicion of bats or their activity before any traps are deployed. Staff can also refer to the English Heritage Landscape Advice Note: Bat Roosts at English Heritage Properties (Internal Use only) which lists the properties in the care of English Heritage where bats have been recorded.

In most cases, thin plastic ‘bat-friendly’ traps must only be used. In situations where these will be known to be totally ineffective, measures such as covering up a blunder trap with a protective wire mesh cage can sometimes be incorporated.

7) LOOKING FOR PESTS

Before you start on a pest hunt you need to have the following items:

- A list of insect traps and floor plans showing their locations
- A supply of insect pest traps monitoring forms
- A supply of new insect traps
- Pen for marking traps
- Sample bags
- Tweezers or forceps
- Flashlight
- Hand held magnifier
- Box for collecting up and storing the old traps.

Look for insects in dark areas using a good flashlight. Look inside folded textiles or where they are touching walls or floors. Check contents of boxes which contain particularly vulnerable material. Look for signs of insect activity such as fresh frass from woodworm exit holes, clothes moth webbing and cases or the cast skins of carpet beetle larvae. Examine windowsills and light fittings in spring and summer for signs of pests.

Even a thorough search or inspection may fail to find insects which are hidden away and this is why English Heritage properties have a programme of monitoring using sticky museum traps and pheromone lure traps to detect and find insects.

Check for signs of rodents such as droppings, chewed traps, gnaw marks, fur etc.

8) PREVENTING PESTS

Cleaning and housekeeping

Cleaning is the most important part of any programme. Many cleaning schedules are targeted on the most obvious public areas which may appear to be superficially clean. A close examination with a good flashlight will usually show accumulations of organic dirt and debris in corners, wall/floor angles and behind fittings and radiators which will support insect pests. Unused rooms and storage areas are often neglected and dirt and debris will provide an ideal harbourage for insects.

Sources of dampness such as condensation, poor damp proofing or leaks from gutters or water pipes must be checked and remedied.

Proofing:

Insects

Doors and windows can be fitted with unobtrusive sealing barrier strips to prevent the entry of larger insects. Some windows and doors can be fitted with fly mesh screening if this is aesthetically acceptable.

Rodents

Fit rodent barrier strips to doors, windows and pipes if these are aesthetically acceptable.

Place steel mesh with a 4mm aperture into gaps around pipes and in eaves to prevent access.

Ensure that exterior drain covers and rodding caps are sound and close fitting.

Birds

Net over alcoves and openings to prevent access and roosting.

Steel mesh pushed into gaps in eaves can prevent access.

Spikes and wires prevent perching on ledges and sills.

Quarantine

An essential part of any pest prevention policy is to keep pests out of collections. Insects can be introduced from many sources including new acquisitions, objects on loan and objects returned from loan.

Objects must always be checked for signs of an infestation before being allowed into the main collection area whether in store or on display. Inspection may reveal insect pest damage and clothes moth webbing but insect pest eggs or small larvae may be difficult to see.

Woodborer emergence holes may be obvious but developing larvae will be hidden in the wood. This means that an incubation period may be necessary to determine whether an infestation is active or long-dead.

All staff involved with handling and movement of objects must be aware of the Guideline and abide by it. Any breach can result in infestation being introduced undetected into collections where they may thrive and cause damage.

9) ACTION

Prevention is better than cure, and all the points made in the section on preventing pests should be the first priority. If pests are found in objects or in the building then some remedial action may be necessary.

So that the Collections Pest Control Manager and Collections Conservation Team can decide on priorities and any action that is needed, it is useful to go through a check list:

- Are there insect pests on traps?
- Is there damage to objects?

- Are there signs of insect pests on objects?
- Are they alive or dead?
- What species are they?
- How many insects are there?
- Are they breeding?
- How many objects are affected?
- Are they in display material?
- Are they elsewhere in the building?

Insects in the environment

Targeted treatment using an approved low hazard insecticidal dust such as the 'Insectosec DE' 500ml insecticidal biocide desiccant dust or the 'Constrain' insecticidal spray can be very effective in reducing numbers of insect pests. Insect pests which live in harbourages will only be killed when they wander across treated surfaces. However, where this course of remedial action is required, staff must always contact the Collections Pest Control Manager for advice before treating.

- Infested textiles, such as carpets and wool felt underlay, which are part of displays and **not historic objects** can be treated *in situ* with an appropriate low hazard insecticidal spray such as 'Constrain'.

- Other aerosols or airborne sprays **must not be used** as they achieve little control of most museum pests and cause indiscriminate contamination of objects.

Localised treatments can only be safely carried out by trained EH Collections Conservation staff as long as they observe the precautions stated on the pesticide label. Only pesticides registered for use in museums by trained staff must be used and a Risk and COSHH assessment must always be carried out with the Territory Conservator and the relevant forms completed.

Any objects treated must always be logged onto the 'EH Treatment form' which must be signed and dated by the staff who carried out the checks and treatment and then either filed in the Health & Safety (H&S) folder on the Teams' shared drive or sent to the Collections Pest Control Manager who will ensure this.

Large scale treatments are usually carried out by an approved contractor. Always ensure that they only use approved and appropriate products by checking with the Collections Pest Control Manager before any treatments are undertaken.

Insects in collections

Options which may be used are:

- physical removal
- heat and freezing treatments
- low oxygen treatment.

The choice of remedial treatment will depend upon the extent of the infestation, the type of material and the value of the object. This is an area where there are many options and treatment of objects and collections should only be carried out by trained Collections Conservation staff. Structural treatment of buildings should only be carried out by the Estates Department Conservation Maintenance Team.

10) CONTACTS

- Collections – the Collections Pest Control Manager, Collections Conservation Team.
- Structural – the English Heritage Estates Department Conservation Maintenance Team.

11) INFORMATION SOURCES

‘Pests in Houses Great and Small’ book by David Pinniger and Dee Lauder

https://www.english-heritageshop.org.uk/pests-in-houses-great-and-small

‘Insect Pests Found in Historic Houses’ poster produced by English Heritage.

https://www.english-heritage.org.uk/siteassets/home/learn/conservation/collections-advice--guidance/eh-bugs-poster-web_240321.pdf

English Heritage Conservation Collections Guidance and Advice notes ‘Pests’ section:

https://www.english-heritage.org.uk/learn/conservation/collections-advice-and-guidance/

‘Pest Management in Museums, Archives and Historic Houses’ book by David Pinniger

https://archetype.co.uk/our-titles/pest-management-in-museums-archives-and-historic-houses/?id=70

‘Integrated Pest Management’ booklet by David Pinniger and Peter Winsor

https://formacaompr.files.wordpress.com/2010/02/ipm_guide-pestes.pdf

Timber - EH Practical Building Conservation book. Editors: Bill Martin, Chris Wood, Iain McCaig and Brian Ridout

https://www.amazon.co.uk/Practical-Building-Conservation-Historic-England/dp/0754645541/ref=sr_1_1?dchild=1&keywords=Timber+Practical+Building+Conservation+book&qid=1620921175&s=books&sr=1-1

'Timber Decay in Buildings – The Conservation Approach to Treatment' book by Brian Ridout.

https://www.amazon.co.uk/Timber-Decay-Buildings-Conservation-Practitioners/dp/0419188207

English Heritage, National Trust, Natural England 2009 Bats in Traditional Buildings London: English Heritage Product Code: 51454

https://historicengland.org.uk/images-books/publications/bats-in-traditional-buildings/

For more English Heritage information sources on insect pests and rodents, including the 'Insect Pests Found in Historic Houses' poster and various insect pest fact sheets, please refer to 'Pests' section on the EH Collections Conservation Advice and Guidance website page on the link below:

https://www.english-heritage.org.uk/learn/conservation/collections-advice-and-guidance/

Other useful insect pest websites include 'What's Eating the Collections':

https://www.whatseatingyourcollection.com/

Guidelines developed by Dee Lauder, EH Collections Pest Control Manager, and David Pinniger, Consultant Entomologist.
December 2006,
updated May 2021.