# Pest Identification and Management

South East Museum
DEVELOPMENT PROGRAMME

Supported by
ARTS COUNCIL
ENGLAND

# Museum Pests

Topics:

- Why do pest come inside?
- Types of museum pests
- Prevention, monitoring and recording
- In-house treatment

# Museum Pests

- Wide variety of pests including beetles, moths, silverfish, lice, rodents and other mammals
- Insects are cold blooded and need external heat for warmth
- Group together into ones that eat animal proteins, wood based materials and ones that eat a variety of materials
- Insects to be worried about are generally quite small
- Need food, harbourage and warm and damp conditions
- In a lot of cases it is the larvae that do the most damage
- Most adults have a short life span so often use sex pheromones to attract mates quickly and repel other species
- Any objects over 20 years old in a museum will probably have been treated with something toxic before the 1986 Control of Pesticides was brought in

# Museum Pests

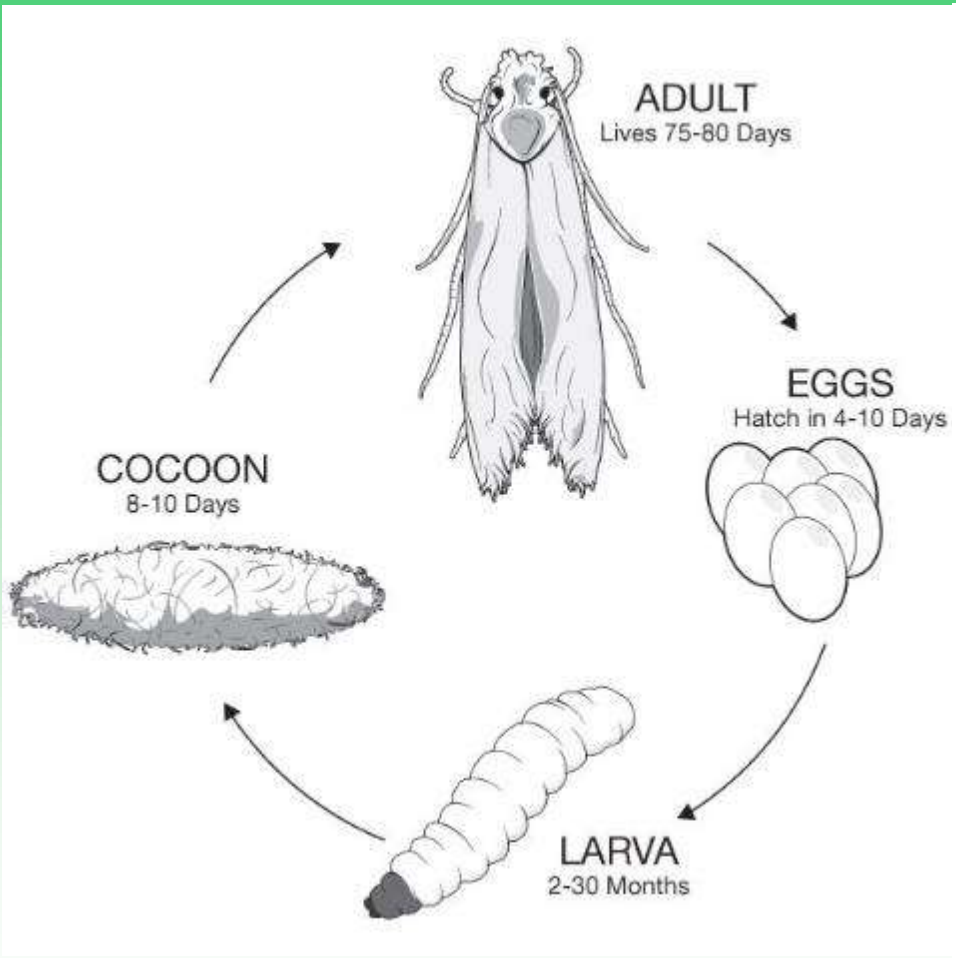
**Why do pests come inside?**

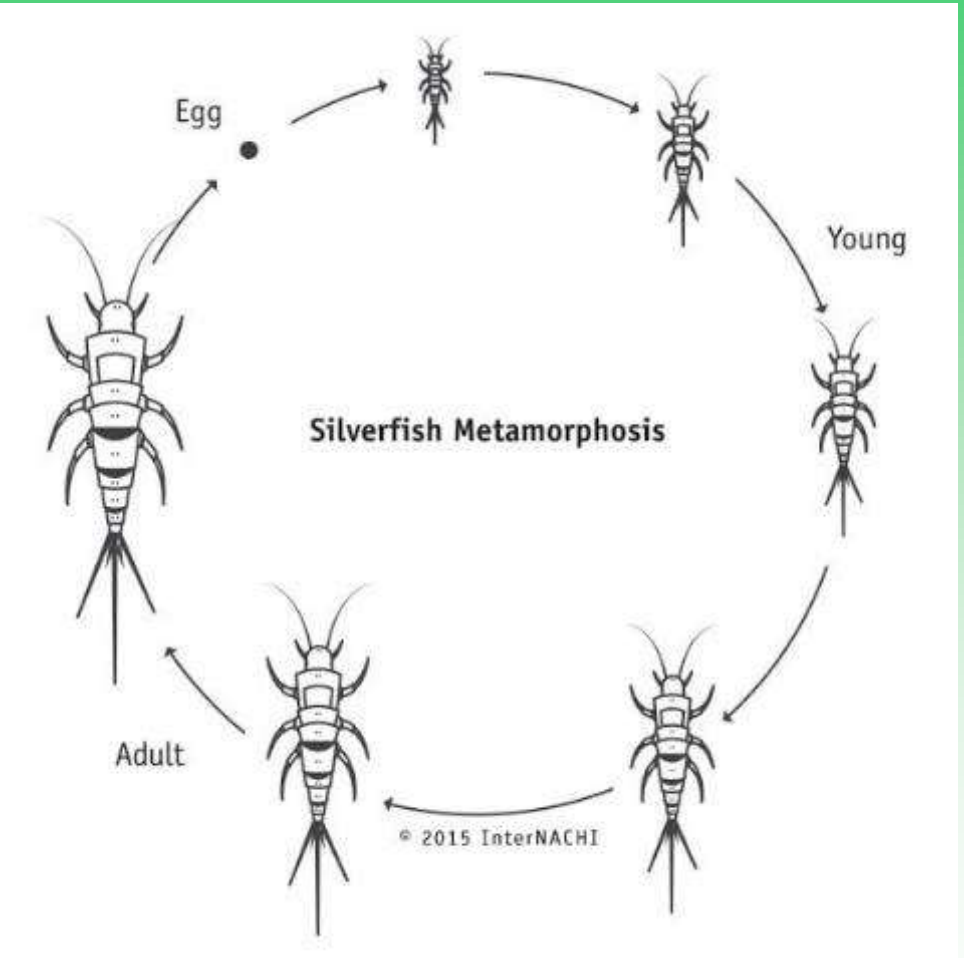
- Looking for somewhere dark and safe to lay their eggs
- To hibernate over the winter
- Food sources
- Accidentally

**How do they get in?**

- Gaps in the fabric of the building
- Chimneys
- Open doors / windows
- People
- New accessions
- Returned loans
- Deliveries

# Life Cycle


ADULT
Lives 75-80 Days
EGGS
Hatch in 4-10 Days
LARVA
2-30 Months
COCOON
8-10 Days


Egg
Young
Adult
Silverfish Metamorphosis
© 2015 InterNACHI

# Wood Borers

## Death watch beetle

- **Size:** Adult beetle is 6-9 mm long
- **Food source:** generally hardwood (oak & elm) and soft wood
- **Conditions:** dark and damp conditions (above 75% RH)
- **Damage:** larvae will tunnel through the wood and leave behind frass consisting of course round pellets – flight holes from adults are 3 mm in diameter. The adult male will bang his head to create vibrations to attract a mate.

# Wood Borers

## Furniture beetle / Wood worm

- **Size:** Adult beetle is 3-5 mm long
- **Food source:** most wood apart from sound heartwood - sometimes damp books and wood pulp
- **Conditions:** dark and damp conditions (above 60% RH)
- **Damage:** larvae will tunnel through the wood and leave behind frass consisting of gritty “wheat grain” shaped pellets – flight holes from adults are 1.5-2 mm in diameter. Larvae can live 3-5 years before pupation

# Wood Borers

## Wood Weevil

- **Size:** Adult beetle is 2-3 mm long – cylindrical and black
- **Food source:** damp wood
- **Conditions:** dark and damp conditions (above 60% RH)
- **Damage:** exit holes are 1mm in diameter – surface of wood looks eroded and irregular

Snowshill Manor, National Trust

# Moths

## Webbing clothes moths

- **Size:** Adult moth and larvae 8-10mm long
- **Food source for larvae:** textiles and animal specimens
- **Conditions:** dark and warm conditions
- **Damage:** larvae will spin silk webbing across the material on which it feeds and leave behind frass which are hard, opaque pellets

# Moths

## Case-bearing clothes moth

- **Size:** Adult moth and larvae is 8-10 mm long
- **Food source for larvae:** textiles and animal specimens
- **Conditions:** dark and warm conditions
- **Damage:** larvae spins a cacoon around itself leaving the end open – eats as it crosses the material leaving a trail of frass which are hard, opaque pellets

# Moths

## White-shouldered house moth & Brown House moth

- **Size:** Adult moth 8-10mm long
- **Food source for larvae:** damp wool, fur, feather, skins
- **Conditions:** dark and warm conditions
- **Damage:** rarely damage clean & dry textiles

# Beetle pests

## Carpet beetle – Guernsey, Varied, Brown (or Vodka) and Two-spot

- **Size:** Adult beetle is 2-3mm long – larvae can be up to 5mm long
- **Food source:** animal specimens, fur, feather, and woollen textiles
- **Conditions:** warm and damp
- **Damage:** “woolly bears” do all the damage - areas of grazing and holes in textiles – leave behind their woolly cases as they grow

# Beetle pests

## Spider beetle – Golden and Australian

- **Size:** Adults are 3-5mm long – hairy and superficially spider like
- **Food source:** wide range of vegetable and animal detritus – paper and wood near infested food – insect collections, animal skins dried plants and textiles
- **Conditions :** can tolerate low temperatures (below 10C) – high temperatures can encourage 2 generations a year
- **Damage:** larvae bore holes in hard materials before pupating in globular silk cacoons

# Beetle pests

## Biscuit Beetle

- **Size:** Adults are 2-3mm long and a redish-brown colour – larvae are white and curved
- **Food source:** hard dried vegetable material including biscuits, tobacco, nuts, papier mache and dried plant and animal specimens
- **Conditions:** warm and damp
- **Damage:** larvae tunnel through material – flight holes are neat and round

# Beetle pests

## Cigarette/Larder Beetle

- **Size:** Adults are 2-3mm long and a redish-brown colour – larvae are white and curved
- **Food source:** variety of dried plant material (including tobacco) and animal protein (ie freeze dried animals)
- **Conditions:** most common in tropical / semi-tropical climates but has been found in heated buildings in the UK
- **Damage:** larvae tunnel through material – flight holes are neat and round


UGA1233095

# Grazers

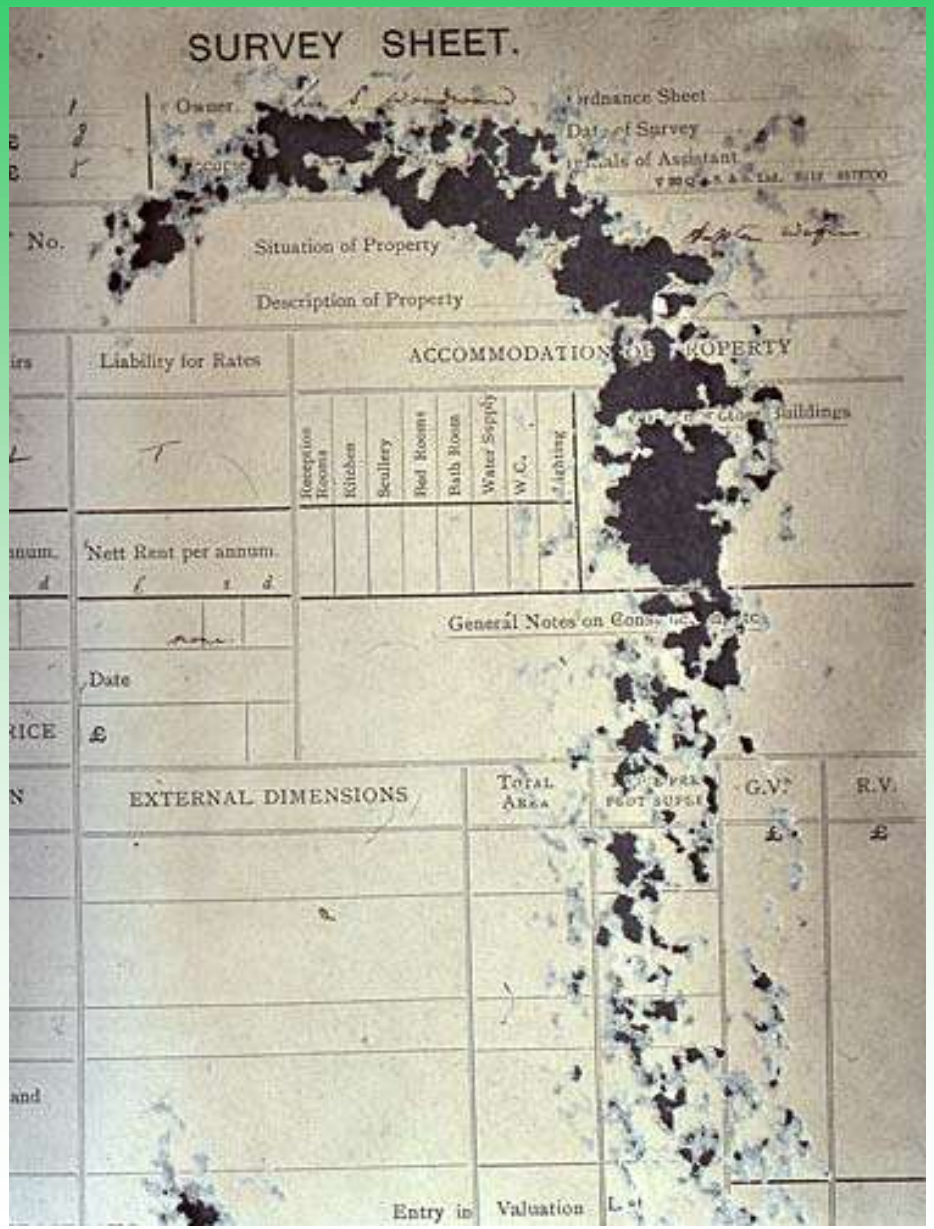
## Silverfish

- **Size:** Adult is 10-15mm long – primitive, scaly and wingless
- **Food source:** microscopic mould on surfaces such as glue and ink
- **Conditions:** dark and damp conditions (above 70% RH)
- **Damage:** ragged, scraped and grazed areas on paper

# Grazers

## Booklice

- **Size:** Adult beetle is less than 1mm long – wingless insects and no males or females
- **Food source:** microscopic mould on surfaces such as flour, paper and cardboard
- **Conditions:** dark and damp conditions (above 60% RH)
- **Damage:** graze the surface of books and paper – squashed bodies will case staining and encourage mould


SURVEY SHEET.

Owner

Ordnance Sheet

Date of Survey

Initials of Assistant

No.

Situation of Property

Description of Property

Liability for Rates

ACCOMMODATION OF PROPERTY

Reception Rooms | Kitchen | Scullery | Bed Rooms | Bath Room | Water Supply | W.C. | Lighting

Buildings

Nett Rent per annum.

£ s. d.

General Notes on Condition etc.

Date

£

EXTERNAL DIMENSIONS

Total Area

Price per Foot Super

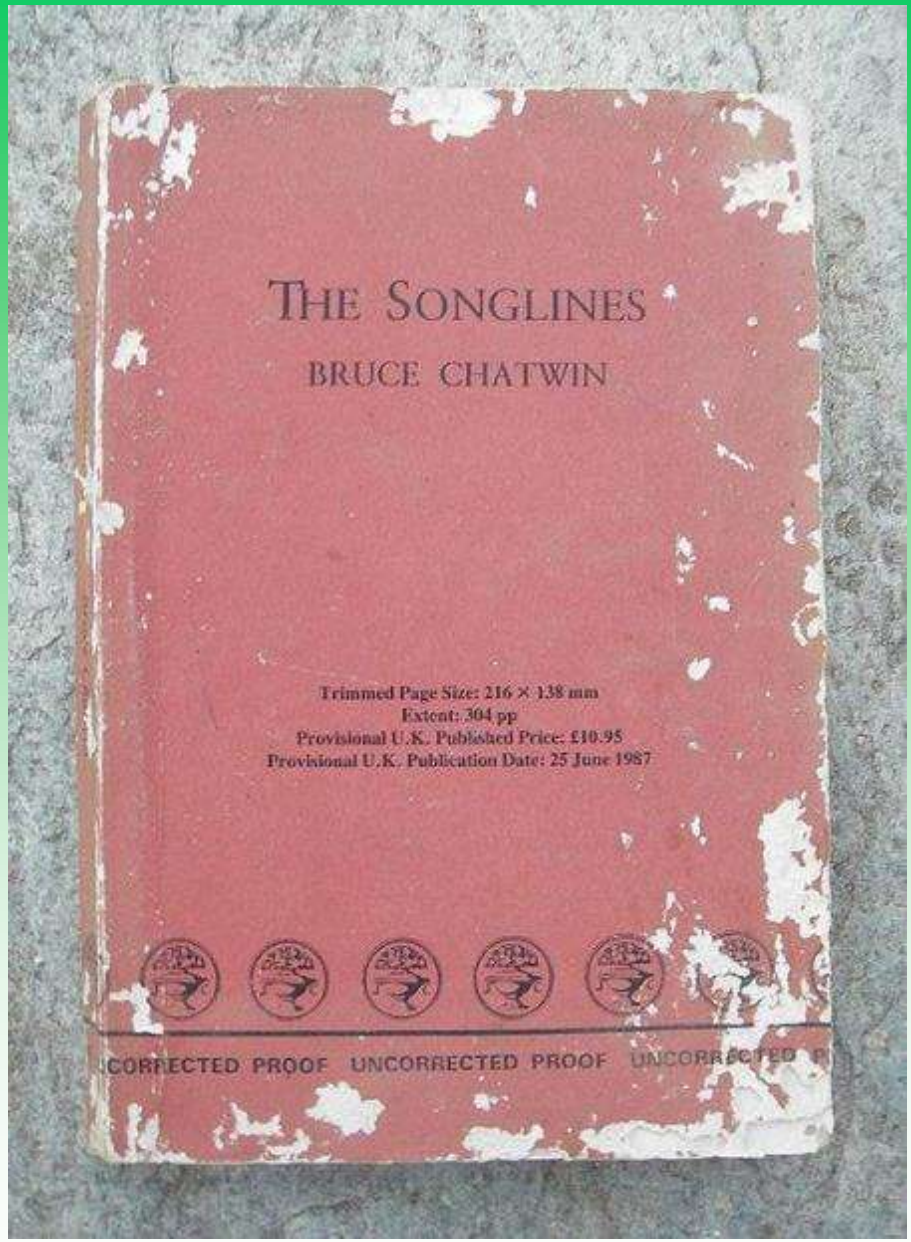
G.V.

£

R.V.

£

Entry in Valuation


THE SONGLINES

BRUCE CHATWIN

Trimmed Page Size: 216 × 138 mm
Extent: 304 pp
Provisional U.K. Published Price: £10.95
Provisional U.K. Publication Date: 25 June 1987

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# Non-pest Insects

## Black ground beetles, Ants, Ladybirds, Spiders, Cluster Flies

- Good indicators of where insects pests can be entering you building / display area
- Food source for other pests

## Fungus / plaster beetles, Woodlice

- Good indicator of dampness

# Other Pests


## Rodents

- Can cause huge amounts of damage
- Facieses and urine can be very damaging
- Any gap you can run a pencil under, a mouse can get in

## Birds

- Bird droppings
- Nests as a home for insect pests

## Bats

- Urine is very alkaline and can corrode objects – especially metals
- Protected species – seek advise from English Nature or Bat Conservation Trust

# Prevention, Monitoring and Recording

## Pest Traps

- Make sure you have the correct trap for the correct pest
- Bat proof traps
- Make sure traps are in suitable locations
- Put out as many traps as you can monitor
- Regular monitoring helps to discover an outbreak quickly

## Recording

- Inspection should take place quarterly and the results recorded
- Always date your traps
- Make a plan of where traps are and how many
- Sticky traps should be replace annually
- Have one or a couple of people who have responsibility for checking the traps

Date:

| Trap No: | Room / Display Name | Position (NB. Please mark with P against trap number if trap has a moth pheromone lure on it ie.5P). | Room Number ↓ | Case Bearing Clothes Moth (adult) | Case Bearing Clothes Moth (larva) | Webbing Clothes Moth (adult) | Webbing Clothes Moth (larva) | White Shouldered House Moth | Furniture Beetle | Varied Carpet Beetle (adult) | Woolly Bear (larva) | Guernsey Carpet beetle | Two Spot Carpet or Fur Beetle (adult) | Two Spot Carpet or Fur Beetle (larva) | Biscuit Beetle | Australian Spider Beetle | Golden Spider Beetle | Cluster flies | Silverfish | OTHER |
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# Exercises

Pest identification

- Pest trap locations

Pest damage identification

- Identify the damage to objects that has been cause by pests

# Prevention, Monitoring and Recording

## Environment

- Temperature not above 20C – the higher the temperature the more energy insects have so will travel further
- Direct sunlight can cause hot spots
- Most insects will not mate under 15C
- Avoid high relative humidity and damp
- Exclusion – make sure all windows / doors are sealed – check any plants/cut flowers coming in – check chimneys / under floorboards

## Hygiene

- Good housekeeping (so the insects to not have anything to eat)
- Avoid food and drink in gallery and storage areas
- Regular inspection as part of cleaning routine
- Tidiness – attics, cellars, de-accessioned items, random stuff!

# Prevention, Monitoring and Recording

## Storage

- Cleaned and checked regularly
- Used well sealed boxes and display cases
- Suitable materials being used
- Mark boxes which are vulnerable and check those more often

## Quarantine

- Quarantining new objects coming into the museum – designated area
- Bag or box object up but must still able to see it
- Check for signs of infestation – if in any doubt incubate over a summer season
- Be aware of what the objects are delivered in

# In- House Treatment

## Cleaning / removal

• Clean the surface of the object – repeat at intervals – a specialist conservator should advise on more invasive cleaning
• Removal of affected objects

## Freezing

• Use widely for textiles and natural history objects – fragile, composite or unstable materials should not be exposed to extreme temperatures
• Need a freezer capable of reducing temp of object with 24 hours
• Do not use self defrost freezers
• Seal objects in plastic bag – remove as much air as possible – absorbent material can be added to stabilise the RH
• - 30C for 3 days, -25 C for 7 days, -18C for 2 weeks
• Do not unwrap until the objects have returned to room temperature

# In- House Treatment

## Oxygen scavengers

- Objects need to be sealed in custom made bags of oxygen barrier film
- Small amount of heat and moisture produced
- Will need an oxygen indicator
- “Ageless” oxygen scavengers can be bought from Conservation by Design
- Generally not economical for large objects
- Three weeks at 25C

## Chemicals

- Constrain – water based pesticide – beware painted and decorative surfaces
- Aerosol foggers – use Permethrin as a pesticide
- Agrodust – silicon based - desiccate silverfish

# In- House Treatment


# Summary

- Not all insects are pests but can be good indicators of where there might be a problem
- Good Housekeeping is essential
- Regular checking, especially in dark undisturbed areas
- Identify your pest and record findings
- Take quick and appropriate action
- Keep checking!