

PEST MANAGEMENT

- Pests
- IPM
- Monitoring
- Response Strategies



Pest Management

- Is there a history of pest problems?
- What policies for food and drink are in place? Who is responsible for implementing them?
- Where are food & drink permitted?
- How is food waste disposed of?
- Is chemical extermination performed on a regular basis?

Common Pests

- Silverfish/Firebrat
- Psocid
- Cockroach
- Beetles
- Webbing clothes moth
- Wood Boring Beetles
- Termites
- Vertebrate Pests
- Indirect Pests

Silverfish and Firebrats

- The silverfish and firebrats are 10-15mm long, silvery to pale brown in color, has a flattened and tapered body, and is primarily found in warm, damp, dark areas
- Both pests feed on books, bindings, paper, clothes, wallpaper paste, and food starches
- Their preferred housing is corrugated cardboard.



Image by: Jim Kalisch, University of Nebraska Department of Entomology



Image by: Insects Limited

Booklice or Psocids

- Less than 1mm
- Eat microscopic mold on the surfaces of starchy or protein-based materials, including glues, book bindings, new plaster
- Needs high humidity to breed and survive

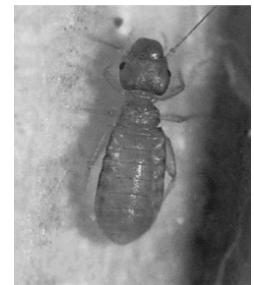


Image by: Insects Limited

Cockroaches

- Will eat book cloth, paper, leather
- Reproduces rapidly



Dermestidae

- A variety of beetle that feeds on dry animal or plant material such as furs, textiles, feathers, leather, wool
- Laval stage causes more significant damage than adults



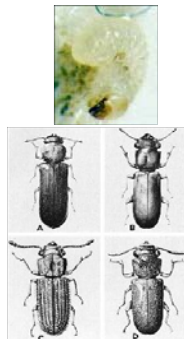
Case Making and Webbing Clothes Moths

- Targets hair, feathers, fur, wool, textiles, and upholstered furniture
- Adults do not eat



Wood boring beetles

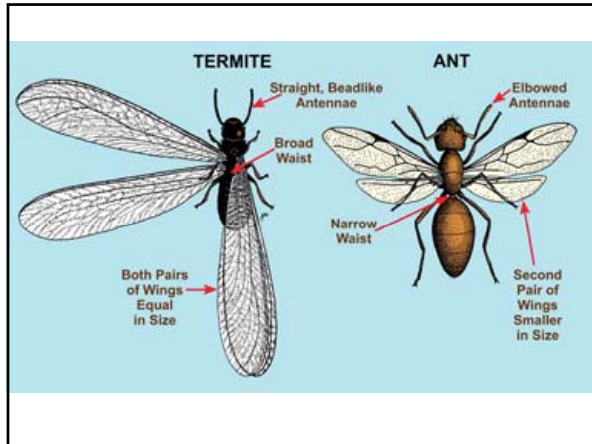
- Lay eggs in wood, will eat paper
- Wood larvae eat at the wood for 2-3 years before reaching adult stage.
- The powder post beetle can damage hard woods or bamboo
- Wood dust or frass may fall off objects, indicating past or present pest activity



Termites

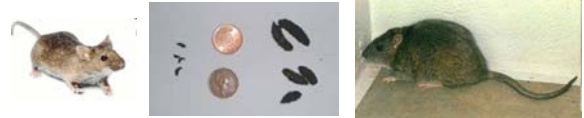
- Termites mostly feed on decaying trees, leaf litter, soil, or animal dung
- Will enter buildings when there is edible material in construction or storage





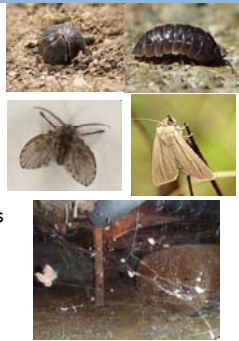
Vertebrate Pests

- Mice can climb through a hole the size of a dime, rats and squirrels a quarter
- Will shred paper collections for nesting material
- Snap traps are inexpensive, effective and safer than poisons
- Bat excrement is oily and can cause damage



Indirect Pests

- Pill bugs are found in warm, moist environments
- Drain flies surface in drains that require cleaning and flushing
- Moths can be attracted by exterior lights
- Not direct pests but carcasses will attract dermestids.
- What are all those spiders eating?



Sleep tight...

- Will manifest as little black dots on books, most commonly in or near the spine
- Freeze or heat to treat



Poll Question

- How many of you have a written policy to manage pests such as we have just been talking about?
 - Y/N or hand raise

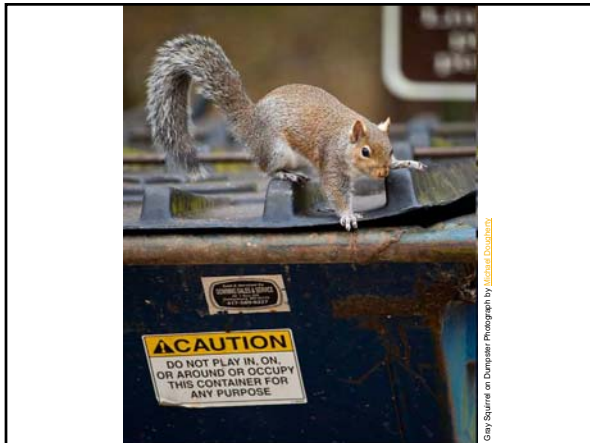
Integrated Pest Management (IPM)

- A chemical-free pest management strategy that focuses on developing and maintaining a storage environment that discourages pests.
- Control pests by creating inhospitable environments inside and outside.
- Monitor for pests and take non-chemical actions to combat infestation unless absolutely necessary.



Outdoor Strategies

- No close plantings, including climbers
 - ▣ Replace with a perimeter of gravel or paving
- No non-essential lighting
- Animal-proof garbage containers away from building
- Clean: Drains/gutters, nests, leaf detrius
- Fill or repair gaps/holes/cracks
- Keep doors closed
- Look for insect damage



Indoor Strategies

- Monitor, look for damage
- Fill gaps/holes in doors and windows
- Repair leaks quickly, check AC condensate pans
- Monitor temp and RH
- Minimize indoor plants



Indoor strategies – cont.

- Are collections stored on floors against walls?
- Remove garbage daily, clean, train housekeepers
- No food at desks, keep staff kitchen clean
- Save found insects





Monitoring

- Traps – insect vs. rodent
- Pheromones



Pop Quiz

- The best way to deal with pests in your institution is:
 1. Clean storage spaces regularly
 2. Isolate and inspect incoming collections to monitor for pests
 3. Keep landscaping under control
 4. Maintain your building
 5. All of the above
 6. None of the above – just use lots of pesticides!

If Pests, Then What?

- Call facilities person or conservator
- If no conservator, bag infested item and any housing before moving
- Clean the area thoroughly and look for other damaged items/pests
- Identify pest and evaluate problem
- Document event and any necessary treatment
- Monitor area

Isolation

- Isolate infested objects immediately by sealing them in a polyethylene bag
- Separate those items that can be frozen from those that cannot.



Treatment: Freezing

- Freeze at -20° F for 48 hours to one week depending on item.
- Thaw for 24 hours
- When re-acclimated to room temperature, refreeze for 48 hours.



Treatment: Controlled Atmospheres

- CO2
- Nitrogen/Argon
- Oxygen Scavengers



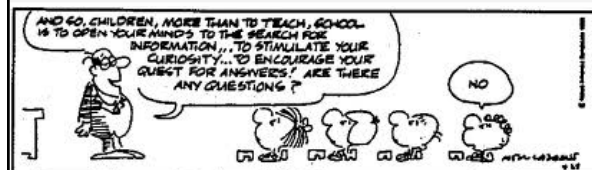
Treatment: Fumigation/Pesticides

- External use for termites or other persistent insects when necessary
- Use only as a last resort indoors
- Only performed by professional exterminators (external) or conservators (indoors).

Helpful Resources

- Museum Pests
 - ▣ <http://museumpests.net/>
- Insects Limited – information and store
 - ▣ <http://www.insectslimited.com/museum%20pest.htm>
 - ▣ <http://www.insectslimited.com/Herbarium%20Pest%20Control.htm>
- Smithsonian Institution
 - ▣ <http://www.si.edu/mci/downloads/articles/pests9.pdf>

Questions?



Homework

- Identify a common pest you have found in your collections.
 - ▣ How could you have discouraged these pests from infesting your collection in the first place?