HIGHLAND
COUNTY • OHIO
RECORDS CENTER & ARCHIVES

ENVIRONMENTAL MONITORING & PREVENTIVE MAINTENCE PLAN

CONTENTS

INTRODUCTION

Statement of Purpose

These checklists outline the Record Center & Archive's responsibilities for preventative maintenance of structure and collections. The county maintenance department also conducts weekly walk-throughs and are responsible for scheduling building code compliance, elevator, and fire inspections as well as regular maintenance.

Security

- ☐ Keys are secure and accounted for.
- ☐ Doors that are supposed to be locked are locked. Locks and access points have been checked for evidence of tampering. Doorbells, buzzers, and intercom are working.
- ☐ The building has been cleared of all people.

Housekeeping

- ☐ Put all food waste in outside dumpster.
- ☐ Wipe down breakroom countertops.
- ☐ Clean floor in break room and high traffic areas such as the entrance. If an event has been held in the collections area, sweep and mop that area. Clean under appliances.
- ☐ Refrigerators and freezers are plugged in and operating. Small appliances are unplugged.

Environmental Monitoring

- ☐ Track relative humidity (RH) and temperature in the Environmental Monitoring Log (see appendix for hard copy version or instructions for Laserfiche eForm, and for the map of environmental monitoring and pest monitoring locations).

Ideal Temp.: 59-77ºF. Ideal RH: between 45-55%.

Notify Records Manager if temperature or humidity exceeds guidelines.

Grounds

- ☐ The garbage area is clean, and containers are securely fastened with lids.
- ☐ Parking, porch and sidewalk areas shall be kept clean and free of trash at all times.
- ☐ All walkways are kept free from accumulated ice, snow and slush. Snow is removed within eight hours after accumulation stops. Rock salt is kept on hand to use if walkways are extremely icy and a danger to residents. Only use salt if absolutely necessary because it can harm the environment.

WEEKLY CHECKLIST

Week One

- ☐ Clean glass doors
- ☐ Clean vents
- ☐ Mop floors
- ☐ Check interior/exterior lights
- ☐ Outdoor drains are free from accumulated leaves, mud and other blockages.
- ☐ IT equipment is operating as expected.
- ☐ Sprinkler system operational

Week Two

- ☐ Dust furniture and windowsills
- ☐ Wash down walls and ceilings
- ☐ Mop floors
- ☐ Sink & toilet work properly
- ☐ Fire extinguishers are operable
- ☐ Monitor pest test traps and record findings in Environmental Monitoring Log. See the appendix for photos and information on common pests, a hard copy version of the Log, or instructions on using the Laserfiche Eform Log.
- ☐ Internal communication systems are operable (intercoms, email, website, etc.).

Seasonal: Spring - Summer

- ☐ Check for nests/add bird spikes.

Week Three

- ☐ Vacuum collections area
- ☐ Clean/disinfect trash cans
- ☐ Mop floors
- ☐ Check utility meters & outside pipes for vandalism
- ☐ Downspouts are functioning
- ☐ Flashlights are operable (one in each desk, breakroom, and weather shelter).
- ☐ Fire alarms operable

Week Four

- ☐ Dust bound volumes
- ☐ Wash Windows
- ☐ Panic button operable
- ☐ Mop floors
- ☐ Check batteries in smoke detectors
- ☐ Plantings, garden beds and lawns are well maintained.
- ☐ Emergency numbers are posted near every telephone.
- ☐ External notification systems are operable (phone, Internet, etc.).

Seasonal: Winter

- ☐ Water spigots/hose bibs are insulated and not dripping.
- ☐ Downspouts are not iced up and drains are functioning.
- ☐ Any above ground or exposed exterior plumbing is thoroughly insulated.

ANNUAL CHECKLIST

- ☐ Replace batteries:
  - Smoke detectors
  - Carbon monoxide detectors
  - Flashlights
  - Environmental monitoring
- ☐ Annual microfilm reader maintenance
- ☐ Safety training
- ☐ Evacuation Training
- ☐ Disaster training

Housekeeping Supplies

- Electrostatic or microfiber dusting cloths
- Lint free cotton cleaning cloths
- Paint brushes for dusting
- Vacuum for cleaning collections
- Vacuum for cleaning floors
- Dust mop
- Dust masks
- Nitrile gloves
- Distilled Water
- Ammonia
- Murphy's oil soap
- 50/50 rubbbing alcohol and distilled water for glass cleaning
- Knee highs to cover vacuum nozzle when cleaning bound volumes
- Q-tips

Environmental & Pest Monitoring Map

CREATE WHEN BUILDING COMPLETE

Environmental Monitoring Log

Mousetraps	1	2	3	4	5	6
Mice						
Rat						

Sensors	1	2	3	4	5	6
Date						
Time						
Temperature						
Humidity						

Sticky Traps	1	2	3	4	5	6
Rodents						
Cockroaches						
Termites						
Beetles						
Silverfish						
Booklice						
Rodents						
Ants						
Flies						
Spiders						
Centipedes						
Earwigs						
Unknown						

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Unknown						

For each trap, record the quantity of each species, and indicate if larva (L), pupa (P), nymph (N), or adult (A).

How to use the Laserfiche Environmental Monitoring Log eForm

NEED TO CREATE

Factors to Consider

Mold

The best means to prevent or control the spread of microorganism growth is to deny the spores the moisture necessary for germination. Therefore, regulating the environment, especially the RH, is essential for preventing the deterioration of a museum collection from microorganism growth.

RH levels should be routinely monitored. Mold spore germination is less likely to occur if RH is controlled between 45% and 55%, but RH should be kept below 65%. When RH levels rise above 65%, the use of portable dehumidifiers will be necessary to reduce the moisture content of the air. A temperature between 18øC and 20øC (64øF to 68øF) should be targeted. These levels only decrease the potential of germination and growth; they do not eliminate it. Therefore, other factors, such as adequate air circulation should be maintained; a fan will help to increase circulation.

Cockroaches

Multiple types are associated with damage to archive materials. All have large mouth parts and a fondness for starch; thus, book cloth and paper are especially vulnerable. Cockroach damage can be recognized by multiple light patches on book cloth surfaces—sometimes down to the thread—and ragged edges on paper leaves. Cockroach droppings can also be detected in the feeding area in the form of pellets. Below, cockroach damage and several species with their eggs.

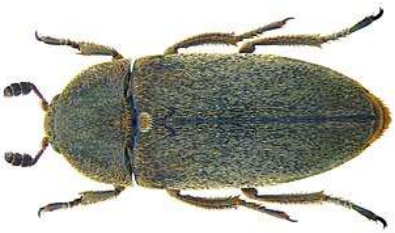
Silverfish (Lepisma saccharinum)

This insect prefers dark, moist, and moderate to warm conditions. Silverfish tend to graze on the surface of paper and seem to prefer coated paper. Paper that is slightly ragged and thinning at the edges is usually the work of silverfish. Silverfish can leave yellow stains on other items, including paper, books, and cardboard boxes. These stains may be indicative of their presence.




Hide Beetles

The Hide Beetle (***Dermestes maculatus***) has been known to damage leather bindings. Dermestids are primarily scavengers that feed on a large variety of plant and animal-by-products, including leather, fur, feathers, skin, mounted museum specimens, woolen and silk textiles, floor coverings, stored foods and carrion. Leather with larvae tunnels below.

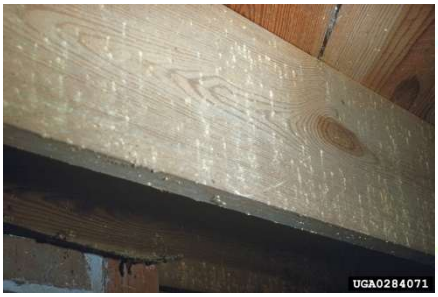



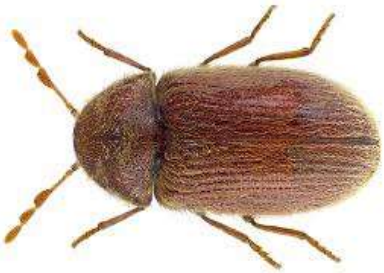
Bacon or Larder Beetle (Dermestes lardarius)

Rroughly 7 to 9 millimeters in length. The rear of the body is pale with black spots, while the rest of the body dark brown. The larvae feed on leather bindings and, when fully fed, bore into the text blocks of books to construct a pupation chamber.

Drugstore or Biscuit Beetle, Bookworm (Stegobium paniceum)

A small (2 millimeters) reddish brown insect with very small larvae. The larvae feed on starch materials, especially the rice or flour paste used on endsheets and book spines. A borehole of approximately 1 to 2 millimeters runs parallel to the height and width of the book. This beetle is found in moist storage areas. As with the cigarette beetle, piles of paper powder signal that this insect is active.






Cigarette Beetle (Lasioderma serricorne)

A small, light-brown flying beetle that commonly infests books. The beetle's larvae are one of the types popularly known as bookworms, with eggs laid on the spine of a book and along the edges. Immediately upon hatching, the larvae tunnel under the binding cover, especially down the spine area. The insect then proceeds to tunnel up to 10 centimeters into the paper text, where it pupates into an adult beetle. The adult leaves a round exit hole, as well as powdered paper on the shelf. One of this beetle's favorite foods is dried flowers and spices; these should not be brought into the library.


Carpet Beetle (Anthrenus verbasci)

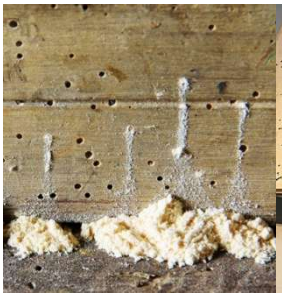
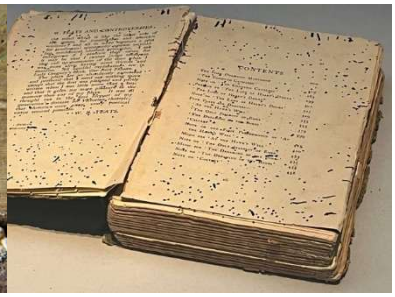
Larvae are particularly destructive and eat animal specimens, fur and feathers, and woolen textiles.



Wood-boring/Powderpost Beetle (Lyctidae, Bostrichtidae and Anobiidae Families)

The term "powderpost" comes from the very fine, powder-like frass (excrement and bits of wood) produced by the feeding process on wooden objects. Look for exit holes where a

powder (beetle frass) will be found. Lyctid beetle frass is loose and has a very fine powder consistency. Bostrichid beetle frass has a tendency to stick together in clumps, feeling gritty to the touch. Anobiid beetle frass contains several pellets and sticks together in clumps. Powderpost beetles spend most of their lives unseen as larvae tunneling within wood, so their frass and the exit holes they make in the wood's surface as they emerge as adult beetles are the primary signs of their presence. The adult beetles are short-lived and seldom seen. Reducing moisture is key in management.

Pill & Sow Bugs (Armadillidiidae & Porcellionidae family)

These insects will attract other pests and provide a food source. Both oval shaped, with bodies that are convex above and flat or hollow underneath, and rarely reach more than ¾ inch (19mm) in length. The head and abdomen are small, but the thorax is larger, composing of seven hardened individual, overlapping plates. These isopods also have seven pairs of legs. They both also have 2 pairs of antennae but the second is reduced and may not be visible. Without high moisture, pillbugs and sowbugs find it almost impossible to survive indoors.

Booklice (Psocoptera Family)

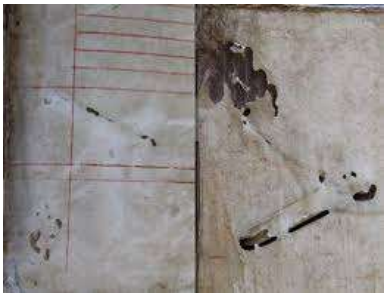
These insects eat fine molds that grow in humid spaces. There can be small trace amounts of mold on older books, cardboard boxes, and more. Luckily, they have no attraction to humans and are easily gotten rid of with pest control methods such as dehumidifying a space, cleaning with borax, and mold cleansers.




Indianmeal Moths (Plodia interpunctella)

The Indianmeal moth (Plodia interpunctella), also spelled Indian meal moth and Indian-meal moth, is a pyraloid moth of the family Pyralidae. Alternative common names are hanger-downers, weevil moth, pantry moth, flour moth or grain moth.

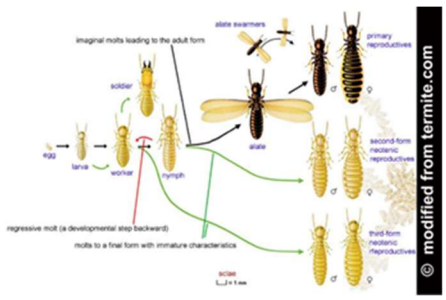




Termites (multiple species)

Termite damage to all paper-based materials can be catastrophic, in that entire collections can be rendered useless by the severe nature of the attack, often before an infestation problem has been recognized.

There are three main types of termites: drywood, damp wood, and subterranean. Termites eat all cellulose materials, including wood, paper, binding cloth, and binding board. Some protection from termites can be given by the building design (use of metal shielding over wooden foundations, painting any exposed wood), but the best remedy is cleanliness, prevention of moisture, and constant vigilance. Depending on the life cycle and role in the colony.

Rodents

Rats and mice are the most common rodents. Rats are difficult to control because they are capable of gnawing through cinder block, lead and aluminum sheeting, wood, plastic, and sheetrock. The most common rats are the Norway rat (Rattus norvegicus) and the roof rat or black rat (Rattus rattus). The house mouse (Mus musculus) is very common and extremely difficult to eradicate entirely. Both rats and mice use paper to make their nests, and many fine books have lost chunks of text through their jagged gnawing. Rodents' fecal matter and urine are especially damaging. It is generally better to trap rodents than to use a poison that will allow them to crawl into building crevices and die, for rodent carcasses are breeding grounds for insects that also damage library and archival materials.

MICE		Brown/Black	1/8 to 1/4 inch	One or both ends pointed	Large clusters	Attic spaces, house walls, roof lines, pipes, under floorboards, kitchen spaces
ROOF RAT		Dark but color fades after a few days	1/2 to 3/4 inch	long and spindle-shaped	Small clusters	Attic spaces, house walls, roof lines, pipes, under floorboards, kitchen spaces
NORWAY RAT		Dark brown	1/2 to 3/4 inch	Fat cylinders with tapered ends	Small clusters	Attic spaces, house walls, roof lines, pipes, under floorboards, kitchen spaces
BAT		Black	Similar to grains of rice	long and segmented	Clusters	Attic spaces, house walls, basement, chimney, garage roofs