



ASSOCIATION OF
**MANITOBA
MUSEUMS**

Pest Guide

Assess, Block, Control, Respond, Recover



Introduction

Artifacts, artwork and archival records are a wonderful source of food and housing for insects and rodents. Pests will take any opportunities we inadvertently provide, and make themselves quickly at home. Effective pest management relies on early detection of pests before they can cause any damage to a collection. By monitoring for pests it can tell us what insects are in the collection, how they entered the collection, where pests are located and if our control strategies are effective.

The *Association of Manitoba Museums Pest Guide* contains easy-to-use insect traps and a high-quality 6x Coil Hi-Power stand magnifier to assist you in identifying pests which may be living in your museum. The insect traps are coated with a sticky, smelly substance that attracts and then traps insects. They can then be identified using the magnifier and the information in this guide.

Mice are usually strong enough to escape the trap, but often leave fur stuck to the trap. Please deal humanely with any mice that are unable to escape. (Mineral oil will free mice).

The Kit and Its Equipment



The sticky traps come in sheets of three traps. Tear off a single trap, write the location and date on the side in the space provided, fold it along the scored lines to make a triangle, and remove the paper strip inside before placing it in the desired location.



To use the pocket magnifier, open the trap and lay it flat over the base. Do not stand it on the trap! Move the trap around until you can clearly see any insects on the trap. The magnifier has no batteries or bulbs to replace. Sometimes what appears to be a speck of dust can be a small insect, so checking closely is recommended.

Once the monitoring period is over, the Pest Control Kit can be returned to the AMM.

How Do We Monitor?



Regular monitoring allows you to identify the pests so that improvements can be made to reduce or eliminate their numbers. Monitoring can continue over the course of a month, a season, the space of a year or even over several years.






It is recommended that the traps be placed for a minimum of two weeks. The placement of the traps is key in order to gather a good sampling of pests. Pests like dark, warm, and damp places and tend to move along walls (they rarely cross open spaces). When placing traps, place the trap so that the short side is flush against the wall. This way when pests move along the wall they will have to step over the glue and get trapped in the process.





Once insects become trapped, they will attract other insects. The insect trap can be checked regularly and put back in the same spot for a number of times before needing replacement. The identified insects can be recorded on a chart similar to the following:






Trap Location and Number	Contents
#1 Window of pioneer house kitchen	Booklice; small spider.
#2 Inside wood storage cupboard in kitchen	Booklice
#3 South end of attic of pioneer house by window	Booklice; spider
#4 Staff workroom by radiator	A sowbug and 2 booklice
#5 Manager's Office	Booklice; carpet beetle larvae
#6 Child's bedroom	Empty; left in place for future verification
#7 South end of basement	Sowbugs

What Types of Insects Are Commonly Found?

	<p>Book Lice, more correctly known as Psocids, feed on pastes and glues in books, including the starch sizing in book cloth or along the edge of pages. They are best known for eating microscopic moulds and are consequently a good living indicator of damp conditions and excessive moisture. Booklice will not cause as much damage to collections as will the damp conditions that attract them.</p>
	<p>Carpenter Ants are black with dark red legs and can range in size from ¼ to ½ inch in length. They have a single bulge, or node, in the narrow area between their thorax and abdomen, and have a smooth rounded thorax. Carpenter ants, unlike termites, do not consume wood but excavate the wood to make their nests. The nests that are found indoors are typically just satellite nests with the parent nest located outside. If the parent nest is not also destroyed, the carpenter ants will continue to come indoors to make more nests.</p>

	<p>The larvae of the Common Clothes Moth will eat wool, hair or feathers found in clothing, carpets, fur, blankets, upholstery, pillows, natural history specimens, piano felts and brush bristles. They obtain a nutritional boost from food, beverage, sweat or urine stains that are often found on these substances. The adult moths dislike direct sunlight and are only seen fluttering around when the light is low. They only live 2 - 4 weeks but the female lays up to 200 eggs. The larvae require a year to reach adulthood.</p>
 <p style="text-align: center;">Silverfish Firebrat</p>	<p>Firebrats and Silverfish are an indicator of excessive humidity and are attracted to the paste and sizing in books and other paper-based records. They 'shave' holes across and through paper.</p>
	<p>Fungus Beetles feed on mold or mildew and are attracted to anything that is musty smelling. They are usually small, red/orange and black in colour. While fungus beetles are not harmful to a museum collection, they are an indicator to high humidity and a possible mold problem.</p>
	<p>Larder Beetles are 7-9mm long and are black with a broad yellow band with black spots across their wing covers. The larvae of this beetle are yellowish-brown with numerous hairs and two curved spines on one end. Like other dermestids they are voracious eaters feeding on a variety of animal based food such as raw skins, furs, feathers, hair and wool with high protein stains such as sweat and blood.</p>
	<p>Mice usually migrate through drains, cracks and crevices, elevator shafts, air and heating vents, and above false ceilings. They are attracted initially to sources of food, moisture and warmth, and then radiate out from a central location. They like to make nests out of cellulosic material and eat anything that can be digested. Once established within a building, mice become long-term inhabitants unless controlled. They can survive without food and water for long periods of time, even obtaining moisture from dry food. As well as being difficult to eradicate, they are prolific and can carry diseases such as Hantavirus and Histoplasmosis. Even dust that has been urinated on can cause an allergic reaction when inhaled or touched</p>

	<p>The Minute Brown scavenging Beetle is small (1.2-2.4 mm long) and flat. It appears pear shaped due to the head and thorax being much narrower than the abdomen. Most minute brown scavenging beetles are brown with distinctive raised ridges or rows of pits on the body. In museum environments, the presence of these beetles is an indicator that there is an ideal damp condition for their food source (fungus) to thrive. This type of beetle is often referred to as a 'mold beetle' due to its food source.</p>
	<p>The Odd Beetle is so named due to the vast difference between the female and the male of the species. The female is wingless and resembles the larvae form whereas the male is fully winged, and tan with slender legs. The larvae are voracious eaters, chewing holes in carpet, clothing, fabrics, books, leather, furs, natural history specimens, furniture, and other insects.</p>
	<p>Pillbugs and their cousins the Sowbugs prefer damp environments. They are usually found in damp or decaying vegetation, wood piles and decomposing leaves adjacent to a building. Their presence inside a building indicates a moisture problem and the existence of access routes.</p>
	<p>Pseudoscorpions are small arachnids (2-8mm long) with four pairs of legs and one pair of larger pincher-like claws. Pseudoscorpions eat small arthropods such as ants, beetle larvae, and booklice. These pests will not harm a collection but merely indicate elevated humidity levels and/or an increased presence of other pests that it feeds upon.</p>

	<p>Rove Beetles are small (usually less than 7mm long) flying beetles with exposed abdominal segments, long sharp mandibles, and short projections at the end of their abdomen they are often mistaken for earwigs). When rove beetles are threatened, they can tip their abdomen up much like a scorpion. However, this is just for show as they cannot actually sting but larger rove beetles can inflict a painful bite. Rove beetles prefer a moist environment and as such are an indicator of high humidity. They do not pose a threat to a collection, but are a beneficial predator that eats more harmful pests.</p>
	<p>As the name suggests, Spider Beetles resemble spiders at first glance due to their rounded abdomens. The spider beetle however, only has six legs but it has a long pair of antennae making it appear to have eight legs. They are a stored product pest mainly feeding on grains and have an affinity for moisture. Spider beetles can also feed on museum objects such as animal skins, books, feathers, hair, leather, silk, and textiles such as wool.</p>
	<p>Spiders and Ground beetles are benign predators and seasonal opportunists, entering buildings in search of moisture or food and lodging. Their presence is an indication that there is a food source. Large numbers found inside a building raise concerns for the integrity of the building envelope.</p>
	<p>Springtails are small insects with an appendage under their tail called a "furcula", which works like a spring. They are attracted to just about anyplace it is both dark and moist, around drain lines in bathrooms, kitchens, basements, crawl-spaces, behind walls, under slabs or siding, and under mulch. They do not pose a danger to museums or their collections, eating only mould, mildew, fungus and decaying organic matter. Large populations can inhabit wall voids, thereby providing a food source for other less desirable insects.</p>
	<p>Woodboring Beetles such as the Powderpost Beetle have been known to attack furniture, tool handles, hardwood floors, wooden display cases and panelling. They are often brought into a building undetected in firewood or lumber. The eggs hatch and the larvae bore through and out of the wood. The fine powder-like dust they leave when emerging is often the first indication of their existence.</p>

What Do We Do With The Information?

An **Integrated Pest Management** program (IPM) based on the principles of *Avoid, Block, Detect, Respond & Recover* is more effective in dealing with infestations than stand-alone procedures such as poison, which may not treat the cause of an infestation. A balance of prevention, good housekeeping, monitoring and non-chemical control can often eliminate or control pests with a minimum of pesticides and expense. Remember, an adult mouse can squeeze through a 2-cm hole and a large adult beetle requires only 1.5 mm.

1. **Reduce the risk of pest infiltration for your building.** Seal all exterior cracks and holes around windows, door frames or light fixtures. Cover vents with fine copper mesh, sealed in place around the edges. Clean debris away from the exterior of your building and if possible, run an 18-inch wide path of pea gravel around it. Keep dumpsters tightly closed. Examine new acquisitions before they enter your building or isolate them until you can be sure that they are pest-free. Remove dead leaf or other organic material from around the building and ensure good drainage. Eliminate damp areas inside.
2. **Avoid providing a habitat for pests.** Maintain clean, orderly storage rooms, especially in attics and basements, and dispose of empty cardboard boxes. Maintain plumbing and line toilet tanks to reduce leaks and condensation. Avoid bringing firewood inside unless you're sure it is pest-free. Choose sheet flooring instead of floor tiles to avoid insects living in the cracks. Avoid false ceilings as they provide pathways to rodents. Store artifacts on shelves, and not in direct contact with the floor.
3. **Avoid providing food to pests.** Avoid storing food in desk drawers, or eating at desks. Check the coils and insulation on fridges for insects. Keep foodstuffs in sealed containers. Store garbage and recycling in covered containers and empty them every day. Wash dirty dishes as they occur. Keep the cupboards under sinks clean and organized as they are close to a source of water, and provide excellent hiding places.
4. **Implement regular housekeeping.** Fit a HEPA filter to your vacuum cleaner and use a crevice tool to vacuum up lint, hair and other organic debris in cracks, crevices and corners, behind radiators, under shelving units and in closets.
5. **Monitor.** If you suspect that there is a pest problem in your building, monitor with purchased or home-made traps so that you can identify the pests and where they are located. Inspect under sinks, to make sure there isn't a leaky pipe. Store natural history specimens such as stuffed animals on white paper and check regularly for larvae, frass (bug poop) or hair loss.
6. **Determine the source of the problem.** As well as dark spaces like closets or attics, insects could be occupying an abandoned bird's nest, or the carcass of a dead rodent. A large number of pillbugs, sowbugs, booklice and silverfish can indicate moisture problems which require evaluation by a contractor trained in moisture/mould remediation.
7. **Bag infested artifacts.** Freeze artifacts as per the Canadian Conservation Institute's Note 3/3 *Controlling Insect Pests with Low Temperature*. If a freezer is not available, winter conditions may provide a cold enough environment. Once all artifacts have been treated, store them in large Ziploc® bags or Rubbermaid® tubs to protect against future infestation.

Additional information can be found online at <http://www.hc-sc.gc.ca/cps-spc/pubs/pest/pnotes/index-eng.php> and <http://pestcontrolcanada.com/>. The Canadian Conservation Institute publishes a series of free Notes including preventing, detecting and responding to infestations. They are available for download at <http://www.cci-icc.gc.ca/crc/notes/index-eng.aspx>. Other publications are available from <http://www.hrc.utexas.edu/conservation/resources/insects/>.

For those who prefer an actual book, the following publication may be of assistance:

Common Sense Pest Control; William Olkowski; Sheila Daar, Helga Olkowski; 1991; The Taunton Press, 63 South Main Street, Box 5506, Newtown, Connecticut, USA 06740-5506