

## About Integrated Pest Management



We are all familiar with the difficulties of avoiding pest infestations in our homes and offices. All buildings are in need of pest control. Developed for the agricultural industry, Integrated Pest Management (IPM) systems have been adapted for use by a wide array of businesses, such as museums and libraries. A tailored IPM program assists in protecting an institution's cultural collections by incorporating the long-term, low-toxicity principles of Integrated Pest Management. An IPM program is also beneficial in protecting your family heirlooms. The four basic steps of an IPM program are: prevent, monitor, identify, and control.

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## Why Use IPM?

An IPM program aims to *prevent* pest infestations unlike traditional pest control methods that aim to treat current pest infestations. Traditional pest control methods often involve chemical treatments that are potentially harmful to the collection or those working with the collection. An IPM program reduces the amount of chemicals used in pest prevention, thus reducing the potential health risks. In addition to

creating a healthier environment, IPM programs save money in the long term. An IPM costs less than hiring a pest control contractor. The low-cost, healthy pest prevention principles of integrated pest management are a great technique for large collections, such as those in museums and libraries and also small family heirloom collections.

## Prevention

The single and most important step to any IPM program is *prevention*. The goal is to minimize and eliminate the sources that pests need to live. In order to prevent pests from entering the building you must eliminate what is drawing them to the area. The first task is to block all entry routes into the area. Examine the exterior and interior of the building looking for cracks and/or holes in the building structure, and gaps around windows and doors.

When located, these areas should be filled, or door sweeps installed, to prevent pests from entering the building. Do not overlook the building's plumbing or drains. Pests can enter structures through basement drains and little used plumbing. Also take notice of water sources around the exterior; identify leaks and/or condensation around plumbing, windows, or climate control equipment. Unnecessary vegetation and trash from around the exterior or inside of the building should be disposed of. Removing trash and debris on a regular basis helps to reduce the resources pests need for nesting.

If your institution or family has acquired a new item for your collection be sure to isolate it before making a permanent home for it in storage. When isolating the object be sure to look for ongoing pest infestations or evidence of previous infestations. If an infestation is noticed, take the appropriate steps in eradicating the problem.

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## Monitor

The least expensive and easiest way to monitor for pest infestations is to simply look for them. A regular and systematic monitoring system should be created to protect our cultural heri-

tage. By regularly and diligently looking for pests, an individual trained to recognize signs of pests will recognize out-of-place matter such as termite wings, frass, fresh exit holes, the cast skins of

dermestid beetles, rodents, cockroaches, and insect bodies or body parts.

In addition to looking for pest infestation, you should select a type of trap for your IPM program. The most common trap used today in pest control is the “sticky” trap. Sticky traps are inexpensive and easy to conceal. The sticky glue is capable of immobilizing any flying or crawling bug that touches it. Use a map of your building to choose locations throughout to place the traps. Traps should be placed in each corner of every room and more should be placed

within large spaces. Do not forget to place traps in attics, basements, and any other area that may attract pest activity. Once the trap locations have been chosen, number and date the traps.



When you have the sticky traps in place, develop a regular monitoring schedule to monitor the traps once a month. Using a pest logbook, record and quantify the catches on each trap. The logbook will keep a record of which traps see the most pest activity throughout the year or during the seasons.

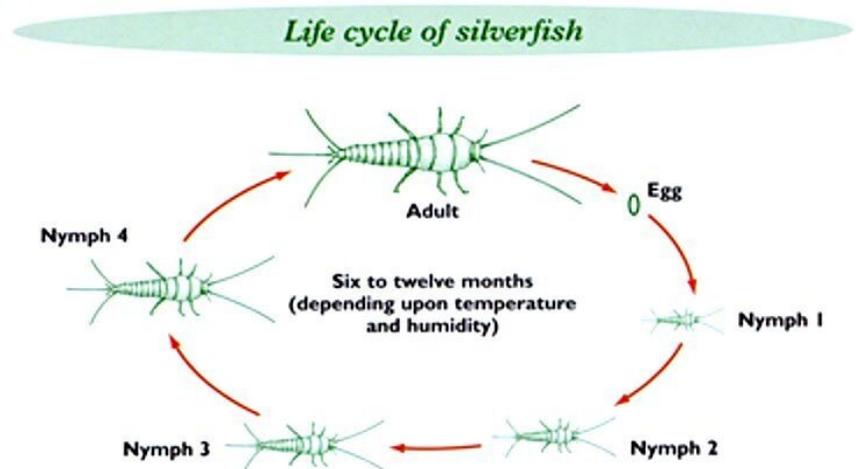
## Identify

Once you have recorded pest activity in the logbook, identify the type and life stage of each pest. Common damaging pests found in collections are: silverfish,

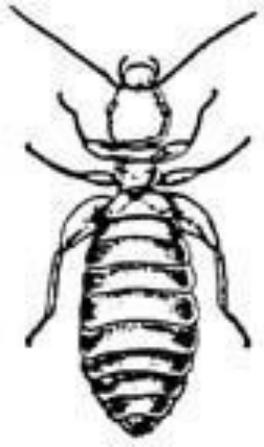
book lice, termites, clothes moths, and beetles. These insects prefer warm, dark, humid environments.

## Silverfish

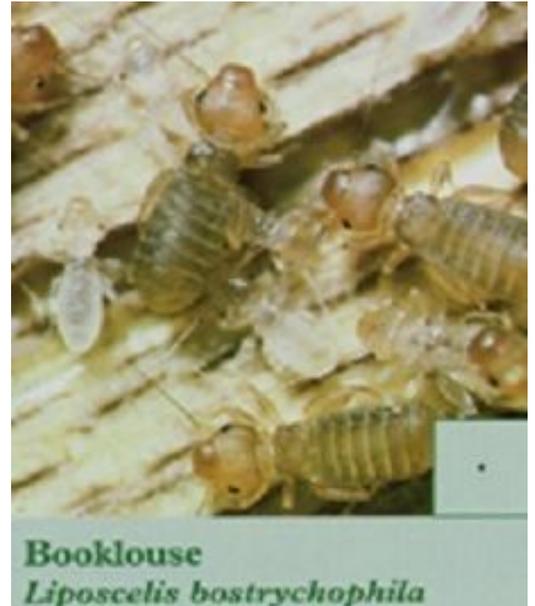
Silverfish are small, wingless insects silver-gray in color that move in fish-like movements. Silverfish are attracted to paper, starches, fabrics, and often eat cereals in the home. This insect prefers warm, damp environments with a temperature range of 72 to 80 degrees F with 72 to 95% relative humidity. Keep areas clean and free of old papers, boxes, or old foodstuffs. Aerosols can help to control these pests.



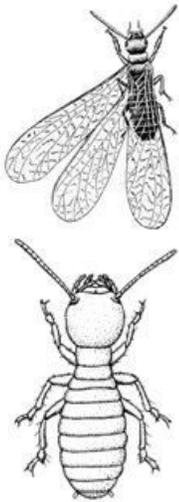
## Book Lice



Book lice are small, colorless insects less than 1mm in length. These insects feed on mold, fungi, other dead insect fragments, and starches found in paper and cardboard. Book lice prefer damp, humid conditions with over 60% relative humidity. By lowering the relative humidity, you may be able to affect the insect's development or cause death by desiccation.



## Termites



Termites are the most common subterranean wood-destroying insects in the United States. They live in colonies with three class systems: workers, soldiers and reproductives. Each class is physically distinct and performs its designated task. Termites feed on wood and

wood products containing cellulose. If you suspect or have a termite infestation, it is important that you DO NOT PANIC. Termites are slow workers and will not bring down your house in one night. Contact a professional pest control contractor to discuss treatments.

## Clothes Moths



Two types of clothes moths include the webbing clothes moth and the case-making clothes moth. The most common moth infestation in fabrics is the webbing clothes moth. An adult moth is golden in color with reddish gold tufts of hair on their head and has a wingspan of approximately ½ inch. These moths are generally poor flyers, therefore they will be found close to infested

items.

Clothes moths are not attracted to light and tend to hide when disturbed. This makes them difficult to observe, so infestations are more likely not to be noticed until damaged fabrics, furs, or feathers are found. Clothes moth larvae do the most damage to fabrics. They will eat wool, feathers, fur, hair, leather,

lint, dust, paper, and occasionally cotton, linen, silk, and synthetic fibers. Fabrics stained with food, urine, and sweat are especially in danger.

Inspection and good housekeeping are the most important steps in preventing

and controlling clothes moth infestations. Freezing has become a treatment that is particularly successful in controlling clothes moths. If you have any questions or concerns about your infestation, contact a professional pest control contractor.

## Carpenter Beetles (common and varied)

The common carpenter beetle is grey to black in color with an orange band, nearly round, and grows to approximately 1/8 inch in length. They are attracted to plant and animal substances such as wool, fur, feathers, hair, hides,

horns, silk, velvet, felts and bone as well as seeds, grain, cereals, cake mixes, red pepper, rye meal and flour. They prefer to feed in dark, undisturbed places.



## Drugstore Beetles (common and varied)

Drugstore beetles infest a large variety of substances especially starches in dried plant and animal products. These insects are store-product pests but have become increasingly annoying to homeowners. These insects may chew

through furniture fabrics, books, and other similar materials. Drugstore beetles are reddish-brown in color and grow to approximately 1/10 inch. The drugstore beetle can be found anywhere near food.



National Folk Museum of Korea  
– museumpests.net

## Furniture Beetles

Furniture beetles (or powder post beetles) spend many months or years inside wood in the larvae state. Their presence is only noticed when they emerge from the wood during the spring as adults leaving small, pin sized exit holes. Small amounts of sawdust, known as frass, are evident on the floor surrounding the infested object. Furniture beetles are cylindrical in shape and measure ap-

proximately 2 mm in length. These insects are attracted to all types of wood and thrive in environments with conditions over 55% RH.

If you are unsure of the type of pest infestation your institution is experiencing, contact a local entomologist or the local county extension agency.



museumpests.net

## Control

The final step in a successful Integrated Pest Management program is control. After an infestation is discovered and the pest is identified a treatment plan should be created to target that specific pest. There is a variety of treatment methods designed to eradicate pests in your collection. Passive methods include caulking around windows and doors, filling all cracks and holes in the building, placing traps on drain pipes, maintaining a clean structure, preventing nest building, and other methods.

Pest infestations can also be controlled through inert methods such as spraying Aerogel around the edges of the room. Aerogel is a silica aerosol. Insects may ingest the tiny, sharp silica when they clean themselves or it can become lodged in their exoskeleton as they travel across the sprayed area.

Freezing is another way of treating infestations. This method is attractive to museums and libraries because it does not involve harsh chemicals and can be carried out in a household freezer. However, the freezer must not be the frost-free type. Freezing temperatures

should reach -20°F or lower within 8 hours.

The first step in the freezing process is to bag and seal the object you are treating. The bag should be sealed quickly to prevent any pests from escaping. Make sure to remove as much as air as possible to prevent condensation or frost crystals. When undertaking this method, it is important to remember materials should freeze quickly. If freezing is slow, insects may have time to acclimate to the changing temperatures. Do not overcrowd objects in the freezer. This may slow down the freezing process. Try to have air circulation all the way around objects by placing them on wire racks or raised platforms. Keep the object frozen for at least 72 hours to one week. Remove the object from the freezer and allow it to thaw slowly at room temperature. Repeat the process. The first round of freezing is to eliminate the adult pests while the second freeze targets larvae. The object being treated should remain bagged until monitoring of the space indicates the pest infestation has been solved.

## Consulting a Conservator

There are many methods for controlling pests in your institution. Other treatments include baiting, anoxia, and pesticides. If evidence of a pest infestation is found in your institution, contact a conservator to determine the best method of treatment. Conservators can also repair and stabilize damage to objects caused by pests.

## Additional Resources

- Bugguide.net. Iowa State University. Department of Entomology. <http://bugguide.net/node/view/15740>
- National Park Service. "Anoxic Microenvironments: A Treatment for Pest Control." *Conserv-O-gram*. May, 1999. <https://www.nps.gov/museum/publications/conservoogram/03-09.pdf>
- National Park Service. "Controlling Insect: Alternatives to Pesticides." *Conserv-O-gram*. August, 1998. <https://www.nps.gov/museum/publications/conservoogram/03-08.pdf>
- National Park Service. "Identifying Museum Insect Pest Damage." *Conserv-O-gram*. August, 2008. <https://www.nps.gov/museum/publications/conservoogram/03-11.pdf>
- National Park Service. "Monitoring Insect Pests with Sticky Traps." *Conserv-O-gram*. August, 1998. <https://www.nps.gov/museum/publications/conservoogram/03-07.pdf>

## Conservation Suppliers

For non-pheromone sticky traps, we recommend "Trapper Monitor & Insect Traps" from Rhodes Chemical. Item number BELTM2600. **Rhodes Chemical** 1129 Merriam Lane, Kansas City KS 66103 Toll Free: 800-255-0051 <http://www.rhodeschem.com/products.html>

### Conservation Resources International

5532 Port Royal Road  
Springfield, VA 22151  
Toll free: (800) 634-6932  
[www.conservationresources.com](http://www.conservationresources.com)  
*Archival housing/storage supplies, photographic supplies, general*

### Gaylord Archival

P. O. Box 4901  
Syracuse, NY 13221-4901  
Toll Free: (800) 448-6160  
[www.gaylord.com](http://www.gaylord.com)  
*General conservation supplies, housing supplies*

### Hollinger Metal Edge, Inc.

6340 Bandini Blvd  
Commerce, CA 90040  
Toll Free: (800)-862-2228  
[www.hollingermetaledge.com](http://www.hollingermetaledge.com)  
*Archival housing/storage supplies*

### Light Impressions

100 Carlson Road  
Rochester, NY 14610  
Toll Free: (800) 975-6429  
[www.lightimpressionsdirect.com](http://www.lightimpressionsdirect.com)  
*Photographic supplies, housing, matting and framing supplies*

### University Products

517 Main Street  
P. O. Box 101  
Holyoke, MA 01041  
Toll Free: (800) 628-1912  
[www.universityproducts.com](http://www.universityproducts.com)  
*General conservation supplies, housing and matting supplies*

### Talas

330 Morgan Ave  
Brooklyn, NY 11211  
Telephone: (212) 219-0770  
[www.talasonline.com](http://www.talasonline.com)  
*Conservation supplies, photographic supplies, general*

## Gerald R. Ford Conservation Center

1326 S 32 Street  
Omaha, NE 68105  
402-595-1180  
[nshs.grfcc@nebraska.gov](mailto:nshs.grfcc@nebraska.gov)



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Nebraska since 1878.