SPRAGUE

CASE STUDY

ARTIFACTS UNDER SIEGE: BATTLING PESTS IN MUSEUMS

Pest threats in museums pose unique challenges, from powder post beetles infestation in the delicate frames on loaned paintings to carpet beetles infiltrating exhibits of roadkill art. Whether it's casemaking clothes moths permeating Indigenous People's artifacts or termites burrowing into wooden structures, the battle against pests in these cultural institutions demands a delicate balance between preservation and pest management.

Museums are not the typical account type for pest management professionals. The need to provide effective pest control services without compromising the integrity of these precious collections and ensuring the safety of visitors and staff is paramount.

A museum can encompass a board spectrum of venues, articles of historical significance can be found in houses of worship, art galleries, historical societies, interpretive centers, archives, or university collections. And while the contents of museums are carefully curated and preserved, and the facilities usually well-maintained, they are just as susceptible to pest incursions as other commercial properties.

Pests are feared by curators due to their ability to damage fibers and fabrics, especially those of animal origin and articles that are made of wood. The animal-based fibers and textiles (i.e., wool, hair, horn, hide, leather, feathers, and parchment) found in many artifacts contain keratin, an attractive food or used for nesting material for a wide range of pests. For example, casemaking clothes moths and Dermestid beetles can digest and gain nutrition from keratin.

Pests, including mice, silverfish and firebrats, termites and other wood-boring insects, are also attracted to the dark or undisturbed areas and the consistent climate often found in museums. They can also be found on dioramas and other supporting materials (i.e., imitation landscape, trees, food, etc.) in exhibits.

"Animal hides, furs, feathers and even certain types of paints, can all attract pests," said Sprague technical consultant Jeff Weier, BCE, who has worked with dozens of museums designing and implementing pest control programs.

And no material or ingredient can be overlooked. Weier said a protein found in egg tempera paint, often used in medieval and early Renaissance Europe paintings, is a pest attractant.

CHALLENGES

Contending with pests in museums and similar settings requires a multifaceted approach for both pest management professionals and curators.

Dan Scott, BCE, a regional entomologist with Sprague, said unlike other commercial properties where providing services is a 'hands-on' process, performing pest control in museums is very much a no-touch service.

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Jeff Weier, BCE
Technical Consultant
Sprague Pest Solutions

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- **A Limited Toolbox:** Due to the delicate and sensitive nature of artifacts within museums, they cannot tolerate any contact with traditional pest control methods, or even any change in the chemistry of their surroundings.
- **Security and Access:** Museums often have a high degree of security and access to exhibits and storage areas may be limited. In many cases Sprague Route Managers must be escorted by museum personnel during service calls adding additional time to the service.
- **Landscaping:** Many museums are surrounded by lush landscaping and gardens where visitors can walk or reflect. These landscapes can attract a variety of pests that threaten museums including varied carpet beetles and casemaking clothes moths.
- **Different Museums, Different Pests:** The pests found in art museums can be different than ones found in natural history museums due to the types of artifacts or exhibits that are on display.
- **Historic Buildings:** Many museums are housed in historic buildings, which can present unique challenges for pest management, such as inaccessible areas and structural deficiencies (i.e., doors that do not close tightly, loose window frames, crumbling mortar, etc.) that provide access for pests.
- **Numerous Entry Routes:** In addition to gaining access to museums through open doors, damaged screens or openings in the foundation or roof, pests can slip their way inside in or onto artwork or artifacts.
- **High Visitor Volume:** The high volume of visitors to museums also increases the threat that pests will gain access on backpacks, articles of clothing, or through continually opening and closing doors.
- **Public Perception:** Museums, much like other businesses, require pest control services to be delivered discreetly. Monitors, traps and other pest devices must be placed where they are not readily visible to visitors or do not detract from the historical accuracy of the exhibits but are still effective in monitoring or trapping pests.

SOLUTIONS

To defend museums and their often priceless and historically significant contents, Sprague uses integrated pest management (IPM) based programs that focus on pest prevention. This program included exterior treatments, rodent baiting and trapping programs, exclusion and sanitation practices, and extensive pest monitoring indoors in exhibit and storage areas where the highest incidents of pest infestation take place.

"The most important elements of any museum's pest control program are inspections and monitoring," said Scott.

Sprague designed and delivered pest control programs for a large – more than 100 rooms - historical residence with an extensive collection of priceless tapestries, carpets, furniture and paintings, which were threatened by carpet beetles. The home was surrounded by acres of lush gardens featuring pollen-producing flowering plants and rose bushes that attracted a leading museum pest nemesis – carpet beetles.

Pheromone trap monitors were installed in a grid pattern on each floor of the residence, including the basement where the storage vaults were located. Curators rolled out tapestries,

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furs, clothes, armaments from the vaults on a quarterly basis for inspection.
On the upper floors where furniture and mattresses containing horsehair – a favorite protein source of fabric eating pests – monitors were discreetly placed on mantles and bookshelves to track carpet beetle activity.

Sprague closely watched the catch data from the pheromone and sticky traps to help determine what action was needed.

"In sensitive accounts, like museums, we let the data guide our decision on whether or not to use pesticides or another treatment method," said Scott.

And much like viewing works of art on display in museums, pest control programs must be observed in 360-degrees or 3D.

Sprague also serviced a large high-profile museum in an urban area that was dealing with an unusual carpet beetle problem in a basement storage room. After a thorough inspection of the room where the beetles were sighted, no evidence of an infestation was found. So where was the source?

Expanding the search led Sprague's pest experts one floor up to the entranceway to the museum's cafeteria where benches – on which school children ate their lunches during field trips – were located.

A closer look revealed that crumbs, crusts and other food particles had fallen into and collected in the floor vents which were located directly above the storage room. This buffet of brown bag lunch leftovers attracted the beetles that were observed in the storage room. A cleaning out of the HVAC ducts and better sanitation protocols reduced the beetle threat.

"Playing pest detective is part of the job normally, but it is more critical when servicing museums," said Weier. "It is important to remember that it is not always the displays or artifacts that bring in the pests."

RESULTS

Designing and delivering effective pest control programs in museums and historical facilities takes time. Comprehensive inspections – a critical step in the process - require time. So does pest monitoring and data analysis.

And with restrictions on the application or use of pesticides in and around artifacts or exhibits, more emphasis will be placed on exclusion, sanitation and cultural practices – all of which require a longer runway to yield results.

Rushing or overlooking any of these steps can place museums and their valuable, sometimes priceless, contents at risk from pests.

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