Stressed About Pests? Integrated Pest Management Training for Heritage Preservation Professionals

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Treatment Options

- Isolation
- Temperature Manipulation
  - Low Temperature/ Freezing
  - Heat Treatment/ Thermo-Lignum
- Anoxia
  - Oxygen Scavengers
  - Carbon Dioxide
  - Nitrogen & Argon
- Chemical Treatments
  - Pesticides
  - Fumigants

Choosing the correct treatment will depend on a variety of factors:
What is the material to be treated? Is it something that might be at risk with a specific treatment type?
What is the quantity of material to be treated? is it a single object, a large group, an entire installation or room or more?
What are your resources, training and comfort level?
Will you need to treatment material regularly or intermittently?
Are you in an institution or in private practice?

The following images are meant to make you think about potential options…

Case 1

Thornton Dial - *Don't Matter How Raggly the Flag, It Still Got To Tie Us Together*

This multi-media piece by artist Thornton Ddial "Don't Matter How Raggly the Flag, It Still Got To Tie Us Together" came to the museum after being stored in a warehouse for a year or two. The artist used assemblages of castoff materials including mattress coils, chicken wire, clothing (wool and cotton), can lids, found metal, plastic twine, wire, Splash Zone compound, enamel, spray paint, on canvas on wood which formed a tasty buffet as the piece was infested with both clothes moths and dermesteds with live larvae of both species seen. The piece was large – approximately 10 ' x 6'. It needed to be treated to go on exhibit.
http://collection.imamuseum.org/artwork/77398/

What would you recommend?

Don't Matter How Raggly the Flag, It Still Got To Tie Us Together

While there are a lot of materials there isn't anything that can't be frozen and the treatment is fast allowing the piece to be readied quickly for exhibit. Freezing would be an option if a walk in freezer was available.

Pat chose to conduct an anoxic treatment using nitrogen gas. CO_2 or argon would have also been options. You need to know what the regulations are in your state. In some states the gases are regulated and you must be licensed to use them.

The process wasn't easy as the "bag" was extremely large. As much air is vacuumed out as possible before the nitrogen was introduced.

Some repairs of small leaks were necessary in the 1st few days

Required Constant Monitoring

✓After 3 weeks killed all stages of pest bioassays

✓Egg, Larvae and Adult

The treatment was fairly time intensive and required constant monitoring.

Case 2

Library and/or archive material

An artist has just donated her archive to the museum. You notice a few critters that you suspect are silverfish when you unpack the box which was delivered from her storage unit. You quickly wrap the boxes in plastic and tape them tightly shut while you consider your options…

In this case we are talking about a box or two… You can open them up and see what is inside. While you could use some form of anoxic treatment, it would be more cost and time intensive than necessary assuming that it is all paper material. If you have access to a freezer that would be the most efficient option. The entire box (which you've already wrapped in polyethylene) can be frozen. I'd probably stick with a one week freeze just to ensure that the interior of the tightly packed material drops to a low enough temperature for long enough to be effective.

Case 2b

Now let's revise the scenario a bit…

Library or Archive Material on a Large Scale

What happens if it is a LOT of material? OK… maybe not this much, but let's say it is many cubic feet of archive material? If you want to stick with freezing and you don't have access to a walk-in freezer then you could investigate a freezer truck or work with a disaster response company that has large scale freezing capabilities. BUT… it would be important to check all the boxes before freezing. You wouldn't want to freeze material like audio or VHS tapes that might be included in the archive. If you aren't sure what is in there you could investigate anoxic options. The Hanwell Anoxibug system with its 5 cubic meter flexicube could be a reasonable expenditure in this case if you don't have access to other gaseous anoxia systems.

Case 3

Textile collections

You are finding larval casings and webbing on a large group of textiles in storage. What would you do?

Freezing would be my first choice here. The textiles can be rolled or folded before bagging. If this is a collection in the southwest in summertime, solar bagging could be a viable option.

Case 3b

Now let’s revise the scenario a bit…

Textile collections with pigment

What if the collection had red colored textiles that you knew came from cinnabar? http://www.metmuseum.org/art/collection/search/64882

Freezing would still be fine but if you chose to go with anoxia then stay away from nitrogen gas treatments. One study showed that minerals such as litharge (PbO), cinnabar (HgS), and sienna (mostly Fe2O3) do experience color change in the absence of oxygen (Arney, Jacobs, and Newman 1979), so care must be taken if this is a concern with artifacts or pigments. …Changes are not noted when pigments are in mixtures, e.g., in paint films. Textiles may be the most likely to change (temporarily). http://museumpests.net/solutions-nitrogenargon-gas-treatment/

Case 4

Native American Collection - Kachina dolls

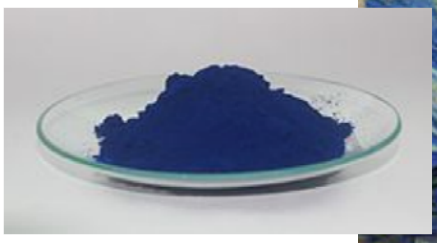
These Kachina dolls are made of a variety of materials including poorly bound pigment on wood, feathers, textile. There are a bunch of them but not too large a collection. Something has been nibbling on the feathers. What would you do?

While there are a several options based on material, number and pest, these items are cultural sensitive which adds another dimension to the choice of treatment. During consultations conducted by the Smithsonian's National Museum of the American Indian with Native American tribal leaders, when the various treatment options were explained, they indicated a preference for remedial treatments like freezing or heat to anoxia as they seemed more "natural" and wouldn't be perceived as "suffocating" the spirits of these pieces. Freezing was the method for treating the vast majority of the 800,000 items that NMAI moved from the Bronx, NY to Suitland, MD between 1999-2004.

Case 5

Now let's revise the scenario a bit…

Paintings



Fine Arts museums like to think that they are less vulnerable to pest infestation but that isn't true! We have treated paintings where the frames or stretchers were infested. Anoxia is generally the method of choice for paintings… But you may have to do some research into the artist and pigments used to determine which gas is appropriate. In this painting the blue used by Van Gogh is Prussian blue which, along with ultramarine have been documented to change color after anoxic treatments. It has been reported that the color comes back… but this should be taken into account when considering treatment options.

Case 6

Non-collection material

The curator of this archaeological collection wants to use sand to cover the pedestals that surround these ceramic anthropoid coffins in the new archaeology galleries. The collection isn't really vulnerable to infestation but it is across the hall from one of the major temporary exhibition galleries. You are worried about what might crawl out of the sand so you recommend….

Heat! Heating the sand for three hours at 55 degrees C in the museum's kitchen ovens would allow you to feel safe about using the sand.

Case 7

Oversize artifacts – Cars and carriages

Heat might also be an option for oversize artifacts like cars and carriages. These upholstery on these collections highly vulnerable to infestation as horse hair was a common stuffing material for the cushions. And oversize artifacts are often stored in barns or warehouses that are not well sealed. Rodents as well as insect pests are probably a concern here as well. Most bubbles or freezers wouldn't be big enough for many of these items but you could work with a pest management vendors that are equipped to do heat treatments on rooms or houses. They should have the capacity to tent the collections and use their mobile heaters to do the job.

Case 8

More oversized objects…

Oversized artifacts – Totem pole

This totem pole was stored outside for many years at the National Museum of the American Indian's Bronx, NY Research Branch before it was moved indoors into the new Cultural Resources Center in Suitland, MD. It was clearly infested and was too long for NMAI's walk in freezer. What did we choose to do?...

This was a case where we felt we had no option but to use a pesticide treatment. We tented the pole outdoors and had it treated using Vikane, a commercial name for Sulfuryl Fluoride. This treatment should only be done by a properly trained and licensed pest management professional. Vikane is not a good option if the artifact/collections contain metal and/or glass as it has been documented to cause corrosion and etching.

http://cool.conservation-us.org/waac/wn/wn07/wn07-1/wn07-105.html

https://www.researchgate.net/publication/261293636_Disinfestation_of_historical_buildings_-_corrosion_evaluation_of_four_fumigants_on_standard_metals

Case 9

Now let's revise the scenario a bit…

Gallery space

This gallery at the Natural History Museum, London is a major thoroughfare for visitors and connects two busy areas of the building. It has a long history of reoccurring pest infestations and many of the mounted specimens have been repeatedly frozen yet become reinfested over time. The historic display cases cannot be moved and housekeeping is a big issue here. It is known that there are voids under and above the displays and under the floor that are full of decades of visitor detritus and provide adequate food and hiding for the entrenched infestation. After an intensive cleaning program the rate of moth captures declines but it is still an ongoing issue. What else might you consider to control the problem?

NHM used a pheromone disruption system (that is available in the UK but not currently in the US) and desiccant dusts like Drione, amorphous silica or borates which cause desiccation of larva are also a good option if they can be introduced into these hard to access voids.

http://museumpests.net/conferences/museumpests-2014-conference/museumpests-2014-conference-monitoring-control/