

Using risk zones in museums as part of an IPM programme

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DOI: xx.xxxx/xxx.2014.xxx.xxx.xxx

Abstract

The Natural History Museum in London is the first national museum to introduce a museum-wide integrated pest management (IPM) strategy which includes the concept of risk zones. This system is based on the principle of pest prevention within a museum building which will always have a resident population of pest insects. The loss of dichlorvos [DDVP] resulted in an urgent need to implement a museum-wide IPM programme to protect vulnerable collections both in storage areas and displays. With such a large, diverse collection in a complex series of interconnecting buildings, it was necessary to break the programme down into sections. The development and implementation of the concept of risk zones; from high risk to low risk areas of the museum has proved a useful and effective method to promote staff awareness and best practise as part of a comprehensive IPM programme.

Key words: risk zones, work habits, IPM, museums, protocols, building management

1. Introduction

The Natural History Museum, London houses 80 million specimens for both scientific research and exhibit. Natural history collections are made up of an enormous variety of collections and materials many of which are vulnerable to pest attack. Mounted animal skins, fur, feathers, dried insects and plant material. The insect pests we encounter in the Museum include *Anthrenus sarnicus*, *Attagenus smirnovi*, *Reesa vespula* and increasingly *Tineola bisselliella*. Historically we have used a cocktail of chemicals to control the pests. eg, DDT, naphthalene, arsenic but each of these has over the years been banned for health and safety reasons. In 2001 dichlorvos (Vapona, DDVP) was the last of these to be banned so we had to dramatically rethink our approach to controlling the pests at the Museum. We did this by forming an Integrated pest management group that was made up of representatives from every department not just the scientific collections and conservation staff; estates, housekeeping, security, functions, public engagement. With backing and funding from higher management we put in place a clear strategy with policies and procedures that everyone needs to adhere to in order to enforce the underlying principles behind IPM to eliminate or limit any possible chance of entry or contamination. These principles were: Quarantine, Monitoring, Housekeeping, Facilities design and maintenance, Storage, Environmental Control, Best work practice, and Risk zones

2. Materials and Methods

The NHM is made up of several complex buildings of different ages, design, fabrics and usage that provide ideal harbourage for insect and rodent pests. The size and complexity of the building was somewhat daunting when we began to put an IPM strategy together so it was suggested that we break it up into more manageable sections and from this came the risk zone concept.

We started by getting drawings from the Estates department, of all the buildings on the South Kensington site. We looked at how the different spaces were used and broadly tried to work out how to prioritise our efforts. We did this by assigning each space a colour which related to the risk posed by pests, red being highest risk then amber, then green for spaces that posed the

least risk from pests. These colours later became the zones and the colour denotes the vulnerability of the collections posed by insects or rodents.

We used the traffic light system, red, amber, green as this is accepted standard for warning and very simple to interpret. Red – a serious risk of damage, Orange/amber – a significant risk of damage and green – less or small risk of damage. It soon became clear that the risk zones were different for rodents and insects so we mapped all areas separately for rodents and insects.

We mapped the museum using this colour method and then as we developed the idea further we decided, that this needed to be visible to all and simple enough to be implemented so we agreed that the next step would be to design signage to alert anyone entering a space in the Museum to what risk zone they were entering and attach a protocol for them to follow.

We added an outline drawing of a beetle and rodent to each of the symbols to indicate the difference and we also added a letter as an alternative to the colour, A for the red, highest risk down to D, lowest risk this was to accommodate colour blindness which affects 4.5% of the population. The print and font needed to be approved by our corporate planning team and large enough to be clear to visually impaired users. We designed the signs to be understood at a glance by everyone at every level at the Museum.

Integrated Pest Management Risk Zone

This collection storage area (with or without workstations) holds material very vulnerable to INSECT damage.

Insect A



Insect D



Help keep pests out:

- **Do not** conduct any maintenance or special cleaning in this area without first getting authorisation from the local curation team.
- **Plan** routes of transport of material to avoid different IPM risk zones.
- **Do not** bring any material (including fresh identification material and new accessions, pot plants and cut flowers) into or through this area without IPM treatment, sealed plastic bagging or inspection by curation staff beforehand.
- **Avoid** opening windows and doors unless pest proofed. Instead, use air coolers or fans.
- **Keep** all cabinet and storeroom doors closed.
- **Eat only** in designated areas.
- **Keep** all vulnerable collection material in overnight collection storage or keep covered.
- **Keep** and transport food in sealed containers.

- **Keep** all packaging and disposable materials in sealed containers where possible and dispose of elsewhere.
- **Keep** area tidy. Special cleaning protocols apply.
- **If you see** any evidence of **insects** please notify the local curation team immediately.
- **If you see** any evidence of **rodents** (droppings, holes, gnaw marks or sightings) please notify your IPM representative AND the Estates Help Desk (6000) immediately.

Additional local restrictions may apply. For more information on what to do in this IPM zone please contact your IPM representative.

IPM Representative Telephone	
Curation Team Contact Telephone	
Local Manager Telephone	

Figure 1 Risk zone sign with protocol.

The protocols were put together looking at the different uses across the Museum and they vary depending on the risk levels. This was the most difficult part of the process and took a great deal of time to achieve a workable set of combinations.

EXMAPLES OF RISK ZONE COMBINATION DEFINITIONS

- A/A** LIFT linking IPM risk zones RODENT (A) and RODENT (C) protocols for RODENT (A) apply.
- A/D** Collection storage areas (with or without personnel workstations) holding collections very vulnerable to INSECT damage.
[i.e. Offices/other areas with PERMANENT storage of VULNERABLE (e.g. HERBARIUM) specimens]
- A/E** Collection storage areas (with or without personnel workstations) holding collections very vulnerable to INSECT damage.
[*Glysglys* (Tring)]
- B/B** Areas of Public Access: Exhibition display material vulnerable to PEST damage.
[Galleries, i.e. open access to the general public]
- C/A** Collection storage areas (with or without personnel workstations), Offices and other areas holding collections less vulnerable to INSECT damage AND/OR very vulnerable material in transit, where food is consumed, prepared or temporarily stored.

Figure 2 Risk zone combinations and definitions.

Once we had worked out the risk zone combinations and the signage two IPM representatives physically went around the different areas of the Museum and assigned them a risk zone. Once these were agreed the signage was ordered and distributed these around the Museum. They were attached to doors and walls near entrances across the Museum and the colours were input onto the mapping system we had at the time. The signs can be changed if the risk zone levels change.

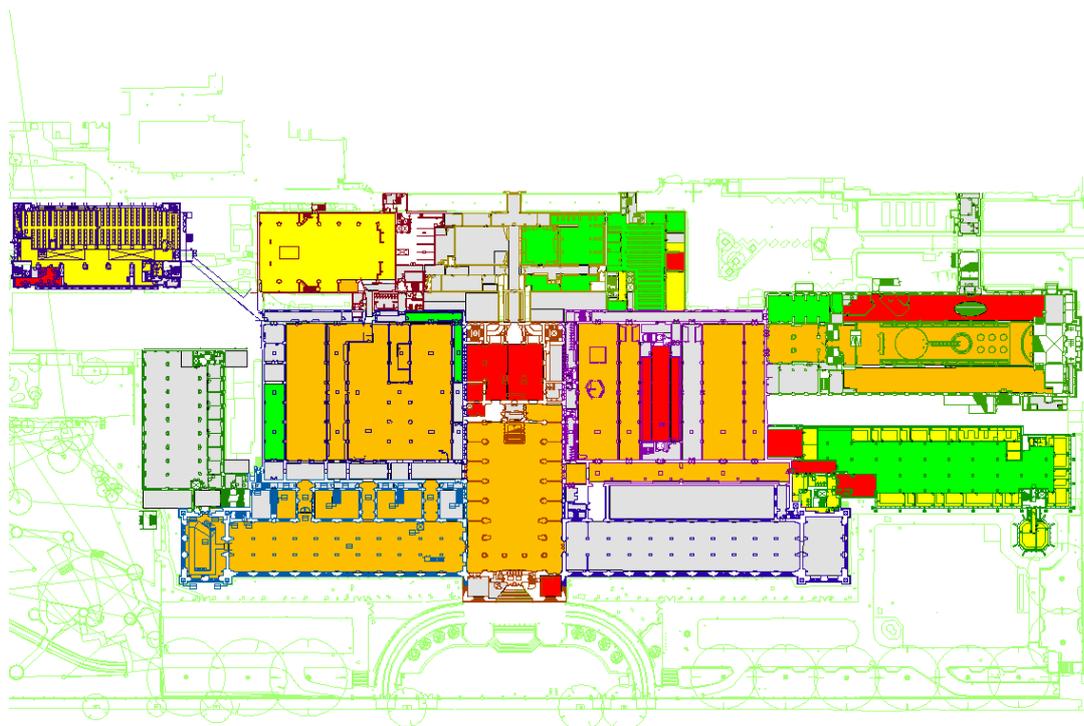


Figure 3 The Museum divided into risk zones.

3. Results

The risk zones in combination with the other IPM measures in place have proved very successful. Rodent numbers have decreased by 70% and the pest beetle counts are now very low throughout the Museum. Moths however, are now a new problem, with a national increase following the loss of dichlorvos we are looking at new ways to tackle this issue. However, the current IPM strategy and risk zones are undoubtedly contributing to limiting numbers and alerting us of problems as they occur.

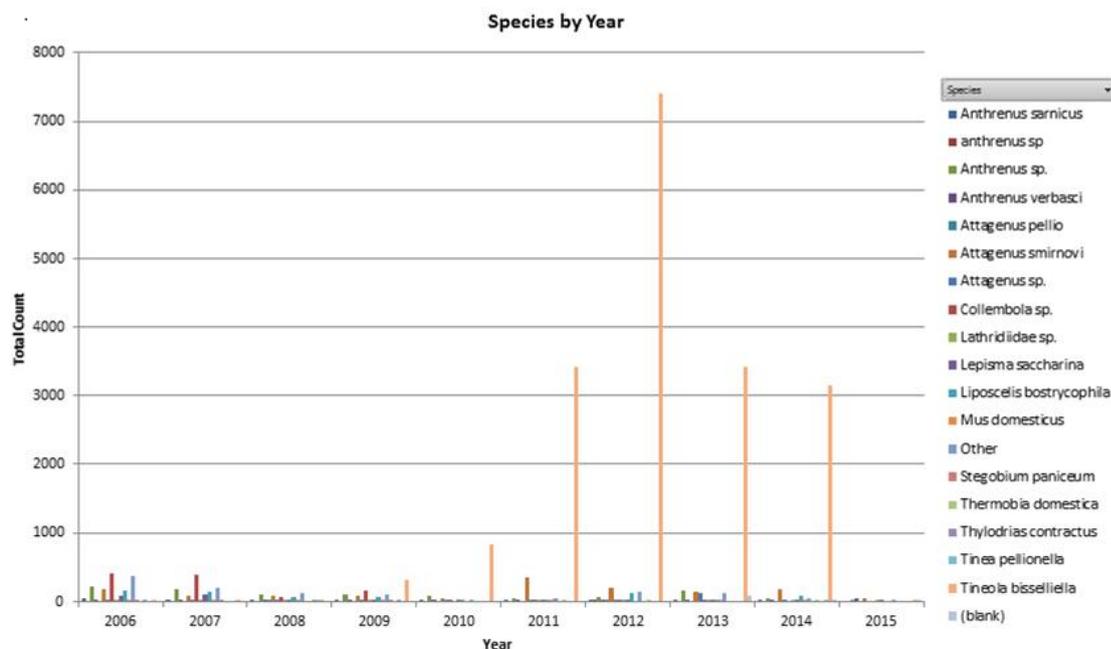


Figure 4 The total pest numbers before and after the risk zones where implemented.

4. Conclusion

It is difficult to quantify the success of the application of risk zones but it definitely has helped the IPM group by breaking up this complex building into more manageable pieces. It also allows us to highlight areas that would otherwise be overlooked by making us look at the whole site carefully. The risk zones concept is a very visible and simple system so there are no excuses not to comply, this is further enforced by the policy, strategy documents and the training to constantly improve awareness of IPM. Combined with the other basic principles of IPM we believe this is a useful and effective addition to an IPM strategy. It is a simple and flexible concept that can be adapted to suit many different buildings and situations.

Acknowledgements

We would like to thank Theresa Wild for supporting us on this project. David Pinniger, Adrian Doyle, Phil Ackery, Clare Valentine and Alison Paul that put many hours into the development of the risk zone concept for theNHM .

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