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Are we really integrating pest management? Reducing pest risk at a large national museum

Abstract

Integrated Pest Management (IPM) is widely accepted as a crucial aspect of collections care. The British Museum aims to protect its vast collection from pest damage with a holistic approach to IPM. The museum has a clear policy, strategy, set of procedures and an outreach and training programme designed to incorporate pest management into every aspect of museum life. However, due to the complexity of its estate and organisational structure, and with increasing demands to use its collections, it can be challenging to ensure that measures to reduce the risk of pests are truly integrated into all activities and initiatives.

The British Museum's pest management plans are successfully integrated into activities such as large collections moves and creating new permanent storage. In these projects, IPM awareness has been an essential element of the programmes, with dedicated members of staff and evidence based learning. It is more difficult to ensure the same methodological approach with some other activities, such as loans, acquisitions, events and refurbishment projects. With pressing deadlines and changing team members, it can be challenging to adhere to our standard procedures. However, the effects of an infestation on mixed collections can be far-reaching and difficult to control. To those with collection care experience, the impact this might have on the preservation of the collection seems obvious, but conveying these potentially devastating effects to members of staff at all levels and with different backgrounds is imperative.

For this paper the authors have reviewed the effectiveness of the museum's pest management policies and procedures, and identified a number of obstacles to incorporating an IPM approach into all museum activities. Consistent communication and integrating pest management from the inception of projects has obtained the most positive results so far. Much work has gone into training and awareness and this has helped to improve aspects of planning. The aim is to enable a thorough understanding of the importance of a successful IPM programme and reaffirm the responsibility of all museum staff for the long-term preservation of the collection. This paper hopes to share the lessons learned for the benefit of other organisations with similar challenges.

Keywords: (IPM) Integrated Pest Management; IPM awareness; IPM communication; IPM training; IPM responsibility

Introduction

The British Museum (BM) cares for over eight million objects, many of which are vulnerable to pest damage. For centuries, the museum used a range of pesticides to control insect and vertebrate pests in the building and collections (British Museum, 2016). However, in view of increasing restrictions and health and safety awareness on the use of pesticides, and with more pressure on resources, a move towards a more holistic approach to reducing the risk from pests has been developed over the last two decades (Phippard, 2011). These days, the museum aims to use integrated pest management (IPM) principles to protect its objects and estate by considering pest risks in every aspect of museum life and with an involvement of all members of staff.

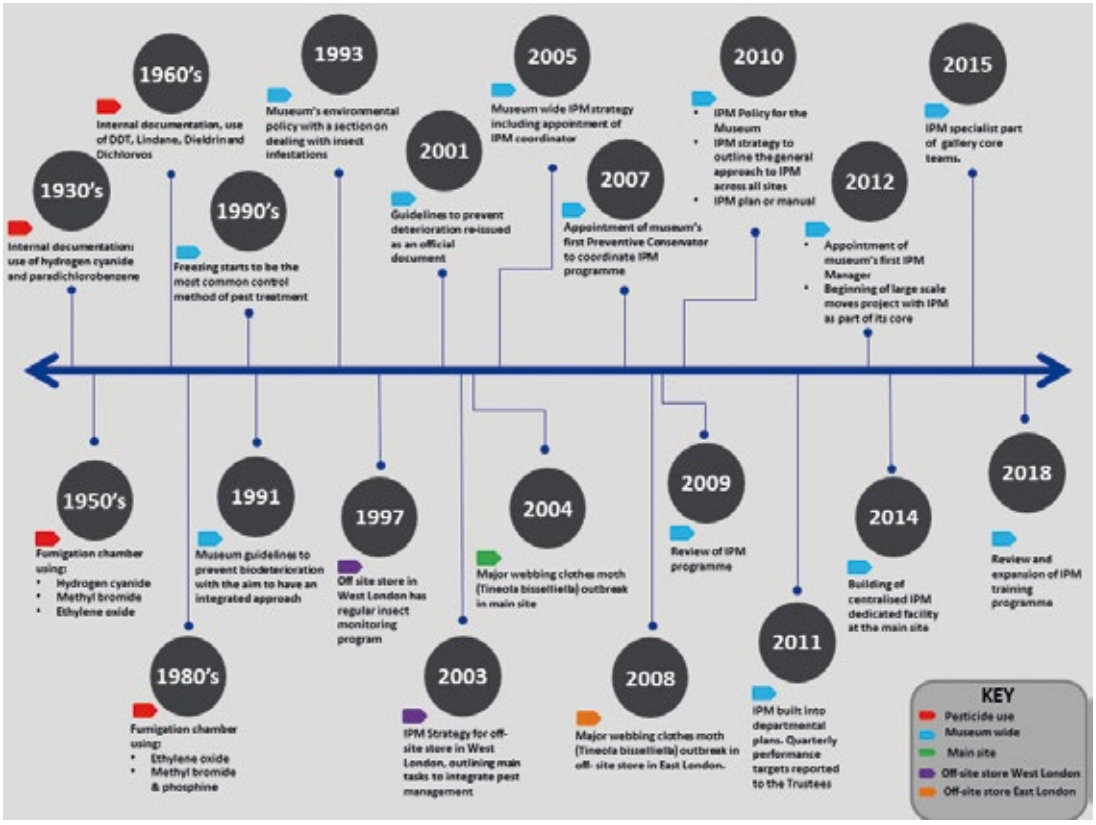

FIGURE 1. A timeline of the development of pest related activities at the British Museum shows a progression away from chemical control towards an IPM focus.

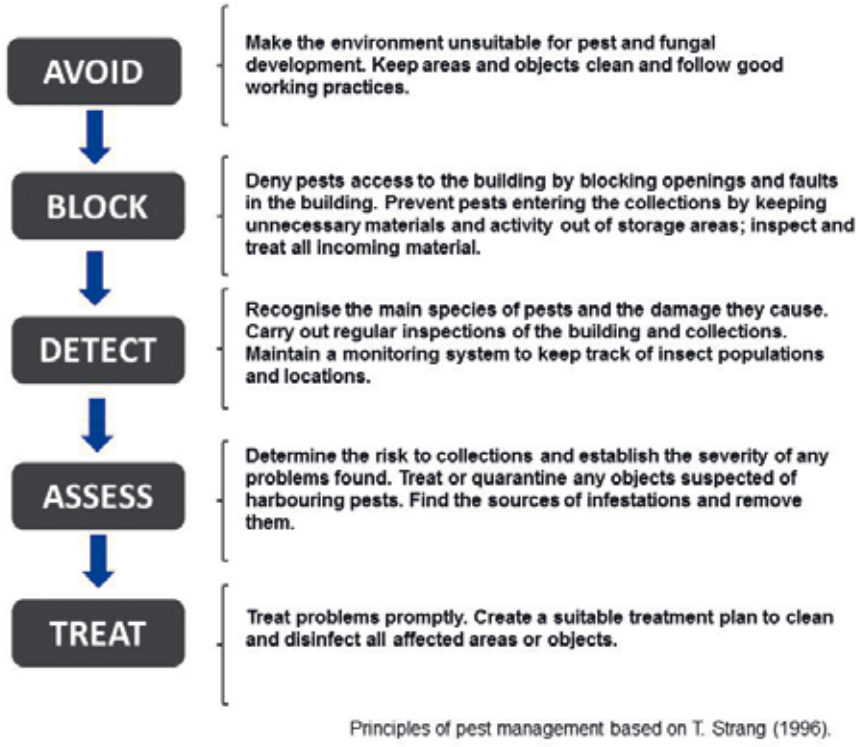

FIGURE 2. The BM's IPM Strategy outlines the basic principles of risk reduction.

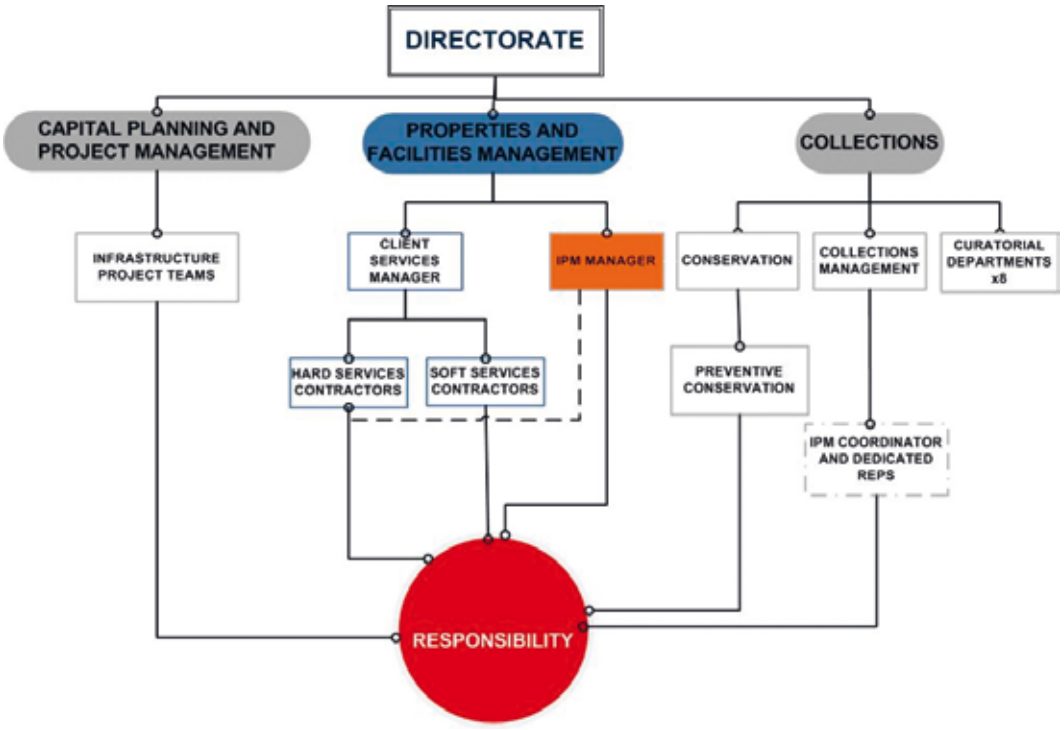

FIGURE 3. Due to its complicated administrative structure, responsibility for IPM related tasks at the museum is shared among numerous departments.

Background

Museum IPM Policy and Strategy

The museum has an Integrated Pest Management Policy which states that:

> 'there is an imperative to use Integrated Pest Management techniques across the estate in the interests of protecting the collections, libraries and archives held by and used for research in the Museum'
> (The British Museum, 2010)

This includes regular monitoring and the completion of risk assessments for all collections and materials entering the site, and stipulates that measures will be based on the concept of pest risk zones. The document emphasises that the success of the programme relies on all members of staff across the museum.

This policy is supported by a strategy that establishes the principles of pest management at the museum (see Figure 2), and IPM is referenced in various sets of procedures with the aim to incorporate pest management in all core museum activities. The strategy document reinforces that staff in every museum department should understand their role in preventing pest damage to the collections.

Responsibilities and Procedures

The museum has a dedicated IPM Manager who is responsible for the IPM programme at both managerial and operational levels. Where IPM issues directly affect collections, the IPM Manager is supported by staff in conservation, collections management and curatorial departments. In addition, there are IPM representatives across non-collection departments who support the programme.

The IPM Manager role requires a strong understanding of collections care but sits within the facilities department instead of within conservation, a strategic decision made to ensure operational involvement across the estate. Many activities essential to the success of the IPM programme, such as cleaning, waste management and catering, are carried out by external companies on contract to the museum. The IPM Manager liaises with staff members who have responsibility for the museum's facilities management contractors and

has oversight of the museum's pest sub-contractor. Crucially, the IPM Manager assists with the specification of these contracts to ensure they will comply with standards set out in the IPM strategy.

Collaborating on activities linked to the collection falls within the remit of the preventive conservation team, with the support of the whole conservation department as well as the collections management teams. These activities include object movement, treatment of objects for pests and processes such as loans, acquisitions and photography.

Challenges

An important aspect of the museum's IPM programme is to ensure activities linked to facilities and collections correlate and work in a fluid manner. In the 1990's there was some preliminary work linked to pest management (Phippard, 2011) but it was mostly reactive instead of a holistic scheme across the organisation. It wasn't until 2004 that IPM became the primary method to prevent pest damage to the collections (Phippard, 2011). From the beginnings of the IPM programme, the museum has aimed to have an integrated approach to all its activities but, perhaps unsurprisingly, along the way the programme has faced numerous challenges.

Responsibility and staff continuity

Integrated Pest Management is understood to be a shared responsibility within the whole museum. However, in such a large and complex institution, it can be difficult to ensure that responsibility for key tasks is identified. Standard protocols can fall by the wayside if they relate to an undefined area of responsibility, for example within storage spaces shared by multiple curatorial departments.

Projects often have staff hired on fixed term contracts and as people leave or move along to other roles, some of the information, decisions and processes established can get lost or altered. This is also true for facilities, which, as mentioned above, can manage changing contractors with a higher turnover.

Planning

Over the last 20 years, one of the main goals of the IPM programme has been to consider IPM as a crucial element of the initial process of every new project within the museum. This has often been a challenge for projects that are not directly related to collections and where the direct effect of IPM might not be as clear, such as special events or construction in non-collection areas.

Projects directly linked to collections but with tight deadlines, such as large loans and acquisitions, can fail to emphasise IPM as a priority towards the end of the project when the solutions become mostly reactive.

The planning of pest reduction improvements has been complicated by the fact that the funds for such activities have been held by different departments, or rolled into budgets for larger contracts.

Security and access

The challenges regarding access can be divided into two subgroups. For public areas, one of the main obstacles to IPM is the increasing demand on the use of spaces for income generation. The museum is open 7 days a week and often has events before and after opening hours, making it challenging and often expensive to schedule housekeeping programmes. In areas behind the scenes, the challenges can be linked to providing the required security access to undertake certain activities. An example of this is facilitating access for contactors to clean inside high security areas such as collection stores, which are often under the direct control of individual curatorial departments that do not have spare capacity for supervision.

Success so far

Training and outreach

The museum has a multi-level training programme to raise awareness of the importance of IPM across the organisation. The training sessions aim to ensure members of staff understand risks and how their everyday actions are crucial to the delivery of a successful programme. Furthermore, the museum has resources and a pest reporting tool available on the museum intranet and the IPM Manager gives talks to every department to promote the understanding of IPM in their specific areas and job roles.

The long-term goal of the training programme is to make IPM training mandatory for all members of staff working directly with collections, as well as converting the induction training to an eLearning tool for all members of staff to complete within six months of joining the museum.

TABLE 1. IPM related training courses

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Training session	**Who is it for**	**Duration**
Mandatory IPM briefing	Contractors working on site	10 minutes
IPM introduction during staff induction	All new members of staff	20 minutes
IPM Introduction: Pests and their risk to the collection	This course is open to all Museum staff. Staff working in the Collections and Operations Directorates are encouraged to attend.	Half day
Intermediate IPM: Standard Procedures and Pests ID	This course is open to all Collections staff who have already attended the IPM Introduction course.	Half day
IPM Users training: Assessing and Preparing Objects for Pest Treatments	All staff who work directly with the collection.	Half day
Training given by external contractor- Pesticide regulation training (understanding health and safety risks of pesticides and hazardous residues in collection materials).	IPM Manager, Preventive conservators and Collections Managers.	Full day
IPM Refresher Training	Members of staff who attended the IPM instruction course over 3 years ago.	1 hour

The museum also has other IPM outreach activities to promote IPM awareness with visitors and external colleagues. This includes participation in events such as Science Saturday, which coincides with National Science Week, a day each year when conservators and scientists talk to the public about their work behind the scenes. Another example is the recent creation of a museum audio trail about IPM, pests, and the work that we do to keep objects safe from this agent of deterioration in the museum. The trail allows visitors to walk around galleries taking into consideration a different aspect linked to the care of the collection. IPM is also an important part of training programmes such as the International Training Programme, a scheme that allows museum professionals, predominantly from Africa, Asia and the Middle East, to come to the British Museum for six weeks of training on a broad range of museum topics. Other outreach activities include behind the scenes tours, gallery talks, podcasts and participation in members and patrons events. These activities are well received and are a valuable tool to spread the awareness about IPM outside the museum and heritage field.

Gallery Refurbishments

Since 2006, the British Museum has had a pest reduction guidance document (Pinniger, 2006), which has been issued as part of the documentation package for project tenders. However, over time it became clear that the guidance was not always fully adhered to and this was leading to pest problems later on. This situation was substantially improved for the temporary exhibitions programme by dedicating a preventive conservator to join each exhibition project team. Building on this success, for the past three major gallery refurbishment projects, a preventive conservator has been assigned as a core team member, to bring IPM expertise to the project, and to follow it through at each stage of the process. Previously, the Con-

FIGURE 4. The IPM Manager delivers pest identification training to members of the storage moves project team. Photo: Trustees of the British Museum.

FIGURE 5. The IPM Manager and a preventive conservator inspect the mechanical space under a new showcase in a recently refurbished gallery. Photo: Trustees of the British Museum.

servation Department was not considered a key stakeholder until later on in projects, during the 'fit out' stage of the process when showcases and other display related matters were being discussed. It is now recognised that it is necessary to have this awareness much earlier in the process, during the infrastructure renewal phase, as decisions made during this part of the project can have a significant impact on pest reduction for decades afterwards. The IPM Manager is also consulted at critical stages during the planning and construction stages to ensure that essential issues are raised and to reinforce good practice throughout the project. Important things to consider include understanding where the electrical, heating and other services run and ensuring that these features are properly pest-proofed, making sure voids are sealed or are accessible for inspection and cleaning, and specifying the correct type of mesh to screen windows and skylights. This is then followed through in later stages when showcases and other displays are designed. Fulfilling this role on a project team requires a specific set of skills that may need to be developed in conservation staff, from being able to read technical drawings and inspect prototypes, understanding the language of designers, architects and engineers, and understanding the needs of staff in facilities and curatorial departments who will use and maintain the spaces for years to come. It is little use having a guidance document if there is nobody on the project to ensure that is translated into action at each stage and detail of the design. An IPM focused design inevitably also reduces risks from other factors such as dust and humidity, and does not necessarily need to increase build costs. In fact, it can significantly reduce costs to the museum later on if spaces are designed to be easier to clean and maintain.

New builds and collections moves

The World Conservation and Exhibitions Centre (WCEC), completed in 2014, is the most recent addition to the BM's historic Bloomsbury estate, and one of the largest construction projects in its 260-year history. The new building provides the museum with significant new spaces to improve the access to, and care of, the collection including a 70 metre long temporary exhibitions gallery, bespoke conservation studios and scientific research laboratories, logistics facilities for loans, a dedicated IPM

facility and approximately 6,000 m² of environmentally controlled storage spaces for some of the museum's most vulnerable collections.

This project was the first time the museum had seriously considered pest risk from the building design stage, which resulted in features with pest-proofing in mind, such as avoiding hard corners and crevices within the building to facilitate cleaning. A meaningful addition to the new site was the establishment of a dedicated central IPM space to ensure all objects can be isolated, quarantined or treated prior to entering the collection. This was achieved through the involvement of Conservation and Science staff, and later the IPM Manager, who helped specify the design of the spaces and commissioned the treatment facilities.

The collections move project for the relocation of approximately 200,000 objects into the new storage spaces within the WCEC had IPM as a core aspect of the project. In fact, IPM was built into the job descriptions of the project team members. The creation of a preventive conservator post for the project was also crucial to provide an effective liaison between the project, the IPM Manager and the rest of the preventive conservation team. It was agreed that every object entering the new stores should be pest treated or quarantined as a precautionary approach which would enable the space to be considered an 'IPM zero reference' area. This reference means that all objects were deemed pest free at a specified date and will help to identify any new problems if they arise in the future.

The project incorporated an upgrade of the documentation for IPM risks, procedures and treatments within the collections database. From this point forward, the museum has established a methodology to clearly record pest treatments and pest treatment suitability linked to individual object records. The successful results have become a standard procedure within the collections management teams and will be taken forward to all activities and new programmes across the museum.

Lastly, the project, which is still ongoing, aims to establish a set of clear procedures regarding object movement to ensure the new storage spaces remain pest free after the completion of the project.

In 2015, the UK government made a decision to sell Blythe House, a government owned shared

FIGURE 6. In addition to inspection and quarantine spaces, the pest treatment facility in the WCEC building includes a walk-in freezer. Photo: Trustees of the British Museum.

FIGURE 7. Due to its length and the difficulty of moving it, this wooden canoe could not be frozen with the rest of the collection being relocated. It was treated in a bespoke bag with carbon dioxide, in a restricted basement area of the museum, before being moved into the new storage facility. Photo: Trustees of the British Museum.

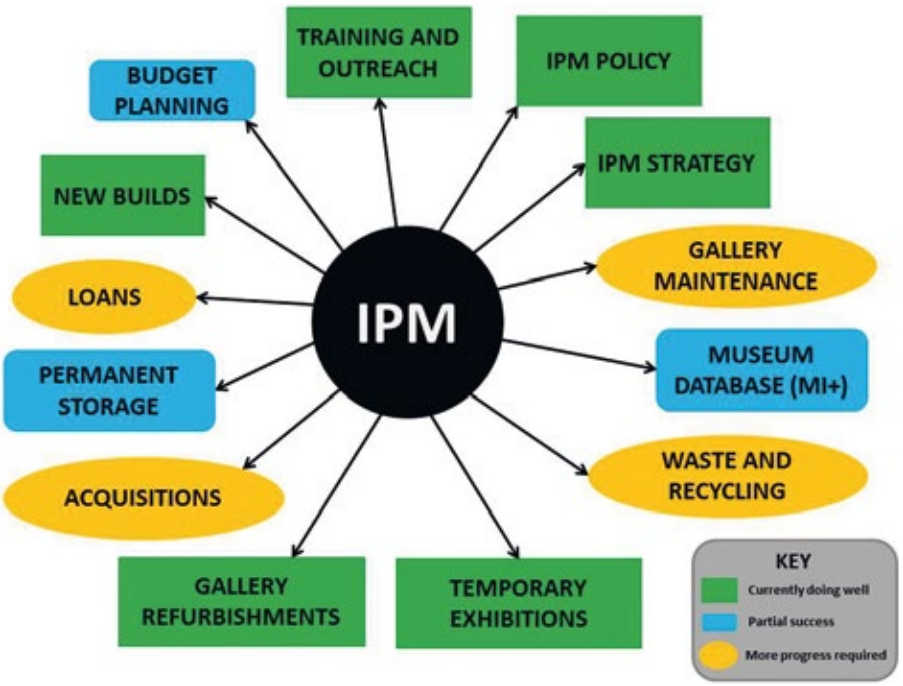

FIGURE 8. This diagram shows how IPM is connected to many different aspects of the museum's business and activities. It also shows how success in some areas is more developed, while there is still progress to be made in other aspects.

storage facility located in west London, where the museum holds a significant proportion of its collections. The BM has taken the opportunity to use government funding to build a bespoke offsite facility, in partnership with the University of Reading. The British Museum Archaeological Research Collection (BM_ARC) will enable the collections housed there to be more accessible for research and loans. The project team has included the IPM Manager and representatives from the conservation department to ensure that pest risks are considered for collections moving into the location, and for long term preservation of the collections in storage.

Next steps

Gallery maintenance programme

Regular maintenance of galleries and other public spaces is sometimes complicated to schedule as it must be undertaken out of hours, increasing costs and limiting scope to tasks that can be finished by the next morning. However, with current trends to increase income generation by using the museum for more private tours and venue hires, it is becoming more difficult to complete these tasks effectively, especially in the more popular galleries. This has meant that maintenance has been done on a more ad hoc basis, sometimes having to take advantage of gallery closures planned for larger infrastructure or redecoration projects. The BM is moving towards a more coordinated programme of regular gallery maintenance to allow the many teams who need access to work in a more efficient way, in order to have the galleries closed for as short a period as possible. This is now more commonly being programmed to coincide with the already established regular rotation of objects for conservation reasons, which provides a good opportunity to clean displays and update labels, as well as service equipment, change lights, deep clean the spaces and undertake any other maintenance, inspections and repairs as required. It is hoped that a regular programme of short maintenance closures will improve the overall condition of the building and displays whilst being more cost effective and less disruptive to visitors and staff.

Measuring success

The IPM Manager supports and develops initiatives from the soft services contractor in maintain-

ing housekeeping levels through key performance indicators, and auditing sub contractual operations including cleaning, waste recycling and disposal.

The BSI *British Standard for Integrated Pest Management for protection of cultural heritage (BSEN 16700:2016)* is a suitable baseline to help define and identify the effectiveness of an IPM strategy and 'a management tool describing IPM policies and procedures.' (2016). The BM is currently investigating options to work towards this standard tied in with its Collections Care Strategy, to develop a strategic approach to improving levels of compliance. Working towards meeting this standard should help to identify how well the BM is actually integrating pest management principles throughout the museum and give a framework to track progress.

Conclusions

It has taken almost two decades to establish IPM at the British Museum, and there is still future progress to be made. This paper has shown that even in a large national museum, which is often assumed to have access to considerable resources, the sheer size of the collection and estate, and the complexity of the institution's management and activities, can pose barriers to effective management of pest risks.

Communication has been identified as key to understanding of IPM as a shared responsibility across all members of staff. As well as having a clear IPM Policy and Strategy, the museum's active outreach and training programmes ensure both staff and the public learn more about IPM. Moreover, training and outreach aim to convey the impact of all museum activities on protecting the collection from pest damage.

As well as training and outreach, the museum has had successes incorporating IPM into the core of new projects such as gallery refurbishments, new builds and collections moves. Challenging aspects such as standardisation of processes across the organisation, management of external contracts, increasing pressure on the use of the estate for income generation and projects with tight deadlines require further work to ensure IPM is considered early on and in a consistent way. Further work is still being done to integrate risk reporting and mapping IPM data in conjunction with environmental data.

Improvements related to IPM across the museum are positive but also represent a permanent commitment, which can, in certain cases, increase the workload and lead-in times for activities. It is clear the benefits outweigh the extra effort; however, it is important to ensure this is understood by all members of the organisation and that adequate resources are allocated. It should be emphasised that pests are not a standalone risk within collections care but a part of the whole interconnected array of risks to the collection. A truly integrated pest management programme requires on-going effort and a willingness to adapt to changing circumstances and demands. The BM has come a long way to realising its goals for pest risk reduction, and with collaboration, good communication and determination, it can continue to protect its collections for generations to come.

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