

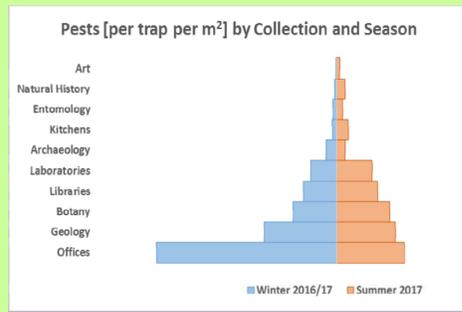


Better pest management through more effective communication of data

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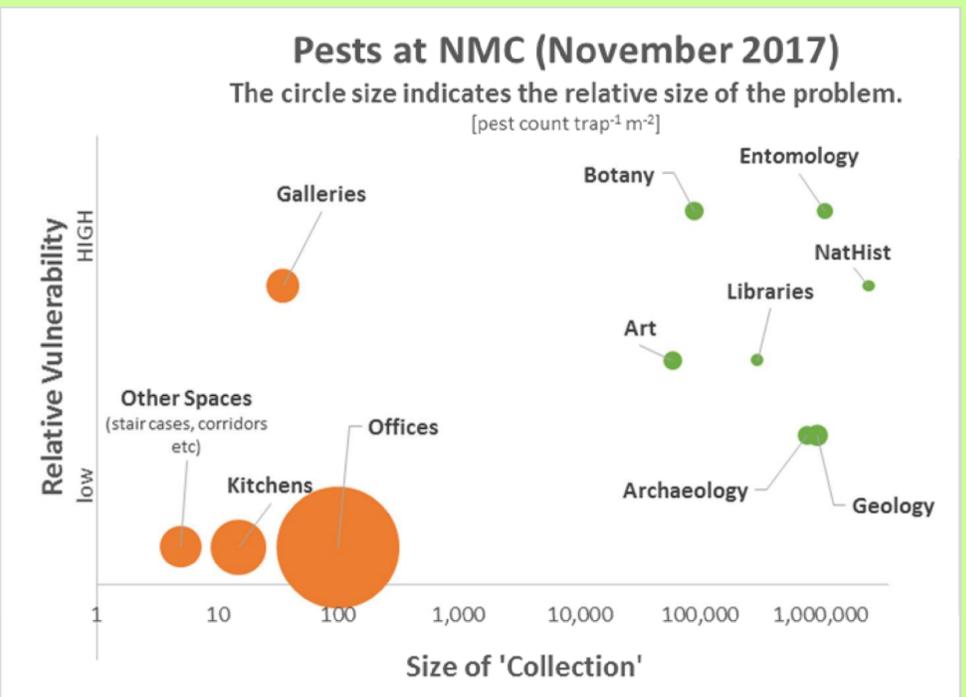
Natural history collections belong to those museum collections most vulnerable to pest damage. Preventing collections from being damaged by pests is a major challenge of collection care. Integrated pest management (IPM) programmes are currently the preferred option within the heritage sector for protecting collections from insect pests. One essential feature of IPM is monitoring and recording, resulting in large amounts of data. While there is a considerable body of literature on the implementation and maintenance of an IPM programme, little guidance exists on effective analysis and communication of data. Our work on data visualisation advocates for more effective communication by adopting novel graphical representations to achieve improvements in communication, which remains an under-researched aspect of collection care. This work was a cross-disciplinary collaboration undertaken between two heritage organisations and an academic partner, with results being relevant to the entire heritage sector.

Indicating temporal change

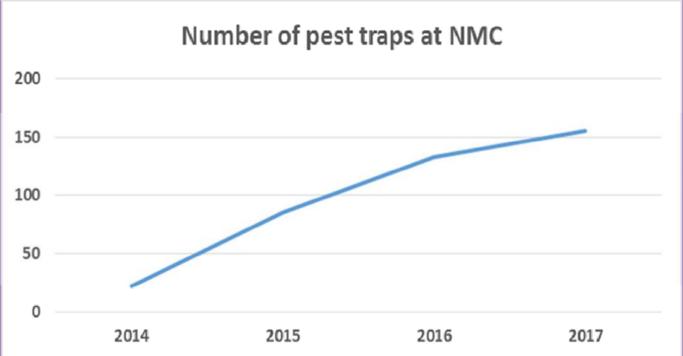
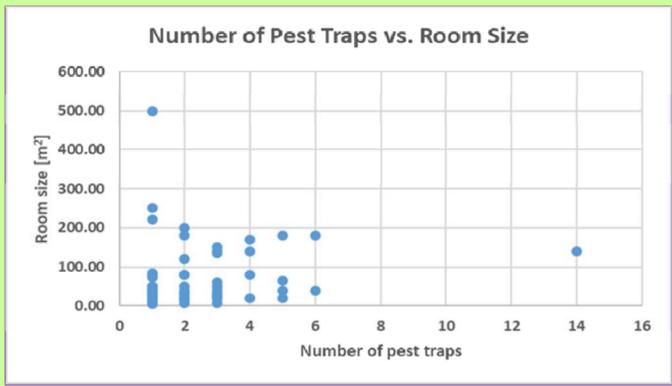


Most pest data relate to dynamic contexts, yet the data visualisation chosen often represents static situations. Other forms of data visualisation, such as the Malthusian growth pyramid, are better placed to represent change.

Trials at National Museum Cardiff



Room size and number of traps matter



The number of pest occurrences in a given room is affected by the number of traps used as well as the size of the room and the type of collection.

Data collection challenge

Row Number	Room Number	Room Name	No. of traps	Room size [m²]	Floor level	Date checked (previous)	Date inspection	Varied Carpet Beetle	Dark Carpet Beetle	Museum nuisance Beetle	Woolly Bear	Webbing Clothes Moth	Clothes Moth larvae	Case-bearing Clothes Moth	Case-bearing Furniture Beetle	Biscuit Beetle
1	E.01.20A	Botany Store	5	20.00	1	06/03/2017	09/11/2017		1		1					
2	E.01.20B	Botany Store	1	8.00	1	06/03/2017	09/11/2017									
3	E.01.20C	Botany Store	5	65.00	1	06/03/2017	09/11/2017			2						
4	E.02.14C	Biology Cryptogam	4	140.00	2	07/03/2017	09/11/2017									
5	Gallery 31	Botany Store - Vase	14	140.00	2	07/03/2017	09/11/2017	5		4				2		
6	Total		29	373.00				0	0	0	1	0	0	0	0	0

Contextual data such as type of collection affected, room size, and number of pest traps deployed also need to be reported to enable meaningful data interpretation.

There are indications that pest management is not always seen as a priority even by museum staff. At National Museum Cardiff, a greater focus on developing visualisations for specific target audiences resulted in increased staff buy-in and willingness to assist with pest management across the museum since the introduction of novel and comprehensive forms of graphical data interpretation.

At present the choice of graphical tools is limited frequently by a lack of data availability. Data interpretation is actually the most crucial step in a pest management programme, allowing success or failure of pest prevention and/or treatment measures to be judged objectively. The current practice of recording only species identification and numbers of individuals detected is insufficient. In response to these findings we devised a solution and technique that makes pest monitoring data more comparable because it accounts for the presence of different trap densities and collection sizes.

The type of illustration used to communicate data also matters to the engagement of the end user. Trials at National Museum Cardiff using different types of illustrations indicated that museum staff responded more positively to data presented in a modified version of a Dorling cartogram.