

# Evaluating the nature conservation mission of museums:

How can museums contribute towards nature conservation and environmental sustainability, through engagement, education, research and use of resources?





This report has been put together as part of an initiative to help museums support positive environmental and social outcomes, called 'Museum Partnerships for Future Earth'. This five-year initiative (2017–22) aims to support museums to contribute towards the achievement of the Sustainable Development Goals. We need to ask the right questions in search of the solutions, and we need to work together to make them happen.

**Henry McGhie, Manchester Museum, University of Manchester 2018**  
[henry.mcghie@manchester.ac.uk](mailto:henry.mcghie@manchester.ac.uk)



**Manchester Museum supports the Sustainable Development Goals**

**This report aims to support the following Sustainable Development Goals,** acknowledging that the 17 Goals are strongly interconnected and cannot be disentangled



Dedicated to the memory and inspiration of the late Stephen Kellert

“The experience of life’s varied enchantments can proceed anywhere humanity occurs: from the agricultural field to the small town to the urban landscape. People need only bring to these varied experiences a sense of wonder, appreciation, and joy of the living fabric. The more we plumb the depths of nature, the more we encounter its unrivalled capacity to nourish the human body and spirit. Every person possesses the ability to mine this creation and thereby enrich his or her existence. This represents the ultimate self-interest of an ethic of respect and reverence for the value of life.” S. Kellert, 1996

“The great challenge of today is to connect our understanding of nature’s contribution to the human body, mind, and spirit to the demands of a world in which nature seems to be ever more in retreat. We must somehow find the means to move beyond experiencing nature as a marginal reality reflected in the occasional visit to a park or some faraway place to making it an integral and essential part of our everyday lives.” S. Kellert, 2012

## Purpose

How do UK museums support, and harm, nature, in the broadest sense of animals, plants, wild places and natural resources, both locally and globally? How can we evaluate these impacts and incorporate them into museum management, programming and operations? Most importantly, how can museums contribute effectively towards nature conservation and environmental sustainability? In an article published in 2004, Brian Miller and others noted that ‘collections-based institutions – zoos, aquariums, museums, and botanical gardens – exhibit wildlife and thus have a special connection with nature. Many of these institutions emphasise a mission of conservation, and, undeniably, they do contribute directly to conservation education and conservation science. They present an exceptional opportunity for many urban residents to see the wonders of life, and they can contribute to education and habitat preservation.’

Because many collections-based institutions hold a stated mission of conservation, Miller and others proposed eight questions to evaluate actions towards that mission. These questions were proposed as conversation-starters, to help museum employees, decision-makers and audiences think about and support their institutions’ nature conservation activities. As they note ‘public support and praise for institutions that are striving towards solutions for conservation problems and pressure on organizations that are moving more slowly towards a conservation orientation can help shift more resources toward saving nature’. A fuller explanation and rationale of the questions can be found in Miller *et al.* 2004 (see references).

In order to move the discussion begun by Miller and others forward, a survey was undertaken of UK museum and gallery workers’ perceptions around how their museums/galleries supported nature conservation, in 2017, expanding on the original eight questions. This aimed to encourage museum workers of all kinds to consider the environmental impacts – positive and negative – that their organisations make, and, if they didn’t know the answer, to think about asking the question. The purpose of circulating this report is to encourage more people to think about the same questions, to consider the responses to the initial study, and decide what they would want their organisation to do in relation to the points raised.

Museums, galleries and similar sites are indeed unusual and present great opportunities for nature conservation and environmental sustainability. They are places where great numbers of people come together to experience ‘something’. Those who work in museums and galleries have significant influence in determining what that ‘something’ is, and what is intended to be achieved as a result. There is plenty of evidence that the great majority of the public have some kind of interest in, connection with, and concern for the future of nature. It is up to those who work in museums to further that interest and connection, address people’s concerns about the natural environment, and encourage and enable them to act on the things they care about.

Henry McGhie, 2018

## **UK Museums and Nature Conservation/Environmental Sustainability**

**What could be done ... and what has been done**

**The museum sector could support nature conservation and environmental sustainability by connecting with related policies and strategies at a sectoral and individual museum level, writing them into museum policy and strategy, and by championing this work from the top.**

There is a strong feeling among museum workers that funders and the sector should incorporate nature conservation and environmental sustainability into the work of museums, but a similarly strong feeling that funders and the wider sector don't currently recognise this role or its importance. Nevertheless, many museums, and many museum workers, connect their work with these subjects, and care strongly that they do so, promoting species conservation, climate change action and protecting endangered habitats. Museums with natural heritage collections play a particularly clear role in this area of work.

**Realising the potential of museums requires a commitment of resources – financial and people – to engaging people with issues and action relating to nature conservation and environmental sustainability (for example through staffing, exhibitions, events for the public, activities for schools and community engagement) and to realise the potential of these collections for researchers.**

More national and university museums commit funding dedicated to engaging people with nature conservation and environmental sustainability, when compared to local authority and trust/independent museums. Museums with natural heritage collections play a particularly key role in providing people with such opportunities, with opportunities to do more.

**Collections relating to the natural world and people's use of it are a key resource for museums, and for society. They not only document natural diversity, but are a creative tool for exploring ideas for a positive and sustainable future. They are an invaluable tool for public groups, policy makers and researchers seeking to understand natural diversity and the ways it is impacted by environmental change.**

Huge numbers of preserved animals, plants, rocks, minerals and fossils are to be found in UK museums, amounting to something like 137 million individual specimens/objects. Most are to be found in national museums and the larger university museums. These are unique and irreplaceable, although they no doubt include some low quality material. These collections can support nature conservation and environmental sustainability, as can objects revealing people's diverse relationships and interactions with nature, and the changing natural environment.

**In order to be able to use collections effectively, museums need to have people skilled in environmental issues, who care about nature conservation, and who can communicate effectively with members of the public on such topics.**

People trained and skilled in nature conservation and environmental sustainability are mostly to be found in museums with natural heritage collections. However, many such collections are looked after by people not confident in nature conservation or environmental sustainability, and few museums (including those with natural heritage collections) specify an interest in these topics when recruiting.

**Museums can support education around nature conservation and environmental sustainability at all levels, and for a wide range of interests.**

Many museums, notably those with natural heritage collections, support college and university education. Many natural heritage museums also deliver such teaching.

**Museums form the basis for a great deal of research that supports nature conservation and environmental sustainability, mostly undertaken by external researchers, nationally and worldwide.**

UK museums, notably those with natural history collections, probably contribute to 1,000s of research publications each year. These are largely based on explorations of specimens preserved in their collections, exploring natural diversity and environmental change.

**Museums use large amounts of resources and there are opportunities to contribute positively to nature conservation and environmental sustainability in the ways these are used, and in terms of how they use their green spaces (where they have any).**

Many museums use their green spaces to provide space for nature, encouraging wildlife, and providing opportunities for the public to experience nature directly. Many museums have sought to reduce their environmental impacts, notably their water use, use of electricity and use of paper. Some other impacts, notably those relating to food and their impacts on habitats, remain to be reduced widely.

**By working in partnership museums can create opportunities to engage the public with nature conservation research and action.**

Museums have a wide range of partnerships with nature conservation organisations and researchers, supporting research, and providing opportunities to communicate research.

**Museums exhibitions can connect large numbers of people with nature conservation and environmental sustainability.**

Many museums exhibit nature conservation and environmental sustainability, but often as a relatively small part of their exhibition programme. Museums with natural heritage collections often have ongoing support for nature conservation as a key outcome of such exhibitions

**By modelling and communicating support for nature conservation and environmental sustainability, museums can help promote and support the wider adoption of such activities.**

Few museums aim to model good behaviour in terms of nature conservation or environmental sustainability; even fewer aim to be leaders in this area.

**The need for effective nature conservation, and to engage people effectively with nature conservation and environmental sustainability, is growing ever more important. Conservation efforts are not making sufficient headway to halt the ongoing loss of biodiversity. Climate action will need to accelerate in order to reduce the impacts of climate change, and to help people, species and habitats adapt to change where possible.**

Much remains to be done to connect museums with nature conservation and environmental sustainability, in order to support these areas more effectively. This will require funding, expertise and, most importantly, the will to make this happen.

## Background

Globally, nature conservation is not making sufficient impact to halt the ongoing decline of the world's wildlife. The Convention on Biological Diversity (the 1992 Rio Convention) is supported by the Strategic Plan for Biodiversity (2011–20), with the vision that 'by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.' The latest progress report showed that insufficient progress is being made to halt the loss of biodiversity (Global Outlook 4). The 'Living Planet' report (2014) assessed there to be half as many individual birds, mammals, reptiles, amphibians and fish as there were 40 years ago. In Europe, 23% of species are currently threatened with extinction. The same situation is found in the UK, where the 'State of Nature' report (Burns *et al.*, 2013) found that nearly two thirds of animal and plant species are rarer than they were 40 years ago. The UK has lost around 44 million breeding birds since the 1960s, and 72% of UK butterfly species declined between 2001–11.

Increasingly, nature conservation strategies include the importance of engaging people with biodiversity and nature, as a positive, connected relationship with nature is linked to pro-environmental attitudes and actions. At an international level, the Paris Agreement on Climate Change (2015) and the UN's 17 Sustainable Development Goals, to transform our world by 2030, acknowledge the key role that public engagement and education will play in the transition towards a more sustainable future; mainstreaming education and awareness of the importance of biodiversity is a key feature of the Convention on Biological Diversity.

At the same time, a substantial body of evidence has grown to demonstrate the benefits of contact with nature for people's health and wellbeing (eg. Natural England, 2012, 2016, Capaldi *et al.* 2014, Bragg and Atkins 2016). Contact with nature has been shown to reduce recovery time from illness, promote physical fitness, help reduce people's blood pressure, help people cope with stress and maintain or regain concentration; contact with nature helps people's general outlook and satisfaction with life (Natural England, 2012). In the UK these health and wellbeing benefits are acknowledged in various government policies and plans (eg. HM Government 2010, 2012, 2018). The wider benefits of contact with nature, incorporating people's shared and collective values, is recognized within the National Ecosystem Assessment, an important framework that directs Government environmental policy in the UK. Engagement with the natural environment is measured and reported as an official statistic through the Monitor of Engagement with the Natural Environment (MENE) (<https://www.gov.uk/government/collections/monitor-of-engagement-with-the-natural-environment-survey-purpose-and-results>).

Social deprivation in England is measured through a combination of scores for the seven domains of income, employment, education, health, crime, barriers to housing and services, and the living environment (indoor and outdoor) ([www.gov.uk/government/statistics/english-indices-of-deprivation-2015](http://www.gov.uk/government/statistics/english-indices-of-deprivation-2015)). The most deprived areas are mainly inner cities and former industrial areas in

the north of England; the same situation applies in Scotland and Wales, although social deprivation is measured in slightly different ways (<http://www.gov.scot/Topics/Statistics/SIMD> , <http://gov.wales/splash?orig=/statistics-and-research/welsh-index-multiple-deprivation>). Availability of nature mirrors social deprivation, which means that **the majority of people who could benefit most from access to nature, ie. those living in inner cities in deprived areas, generally have least access to it.** The MENE survey found that people less likely to visit the outdoors include the BME population, people from lower-income socio-economic groups, people aged over 65 and people with a long-term illness or disability (Natural England 2015).

### **A stronger role for museums**

In an increasingly urbanized world, museums and other 'mediated nature' experiences will become increasingly important as potential sites for environmental education and influencing nature connectedness, and as sites to engage people with nature. They have an especially important role when there are low amounts of high quality nature available locally, in deprived inner city areas, where many museums are located. Conservationists have called upon zoos to redirect their missions to address conservation and environmental education explicitly, with some success, giving them a role in keeping with contemporary concerns of wildlife conservation (see references in Miller *et al.* 2004). The museum sector has been slower to accept this mantle, although environmental education and related activities feature in the exhibitions and programmes of many museums, especially those with natural history (natural heritage) collections. This report aims to help museums consider how effectively they are delivering a mission in support of nature conservation and environmental sustainability, and as a source of ideas on how they can make an effective contribution towards a future where people and nature flourish together.

On the positive side, museums and galleries reach large numbers of people, their collections have much to offer to researchers working in fields related to nature conservation; on the negative side, their institutions make a large negative environmental impact, consuming large amounts of energy and resources.

A transformation towards a positive, sustainable relationship with – and use of – nature will require great shifts across society. As potentially value-shaping organisations, museums, galleries and other cultural institutions have a responsibility in helping achieve such a relationship, for the benefit of all and the natural environment. In so doing, they will build a sustainable future and purpose for themselves, fulfil public trust in which they are held, and help achieve a better future for all in a rich, vibrant natural environment. Museums do not need anyone's permission to take a leading role around environmental education and engagement: they just need the appetite to meet the very real need for such a role.

## Calls for greater public engagement with biodiversity and the environment from key strategy documents

<p>UN Framework Convention on Climate Change (1992)<sup>1</sup></p>	<p>Article 6: Parties shall... promote...</p> <ul style="list-style-type: none"> <li>(i) the development and implementation of educational and public awareness programmes on climate change and its effects</li> <li>(ii) public access to information on climate change and its effects</li> <li>(iii) public participation in addressing climate change and its effects and developing adequate responses...</li> </ul>
<p>Paris Climate Agreement (2015)<sup>2</sup></p>	<p>Article 12: Parties shall cooperate in taking measures, as appropriate, to enhance climate change education, training, public awareness, public participation and public access to information, recognizing the importance of these steps with respect to enhancing actions under this Agreement.</p>
<p>UN Sustainable Development Goals (2015)<sup>3</sup></p>	<p>e.g. 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development</p> <p>11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.</p> <p>11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.</p> <p>12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.</p> <p>13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</p>
<p>Global Biodiversity Outlook 4 (Secretariat of</p>	<p>By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use</p>

the Convention on Biological Diversity 2014a,b)	it sustainably.
Biodiversity 2020 (DEFRA 2011)	<p>It is crucial to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help. Civil society organisations play a front line role, directly engaging and enthusing the public about biodiversity. We will work with them to engage more people and empower them to make a difference...</p> <p>By 2020, significantly more people will be engaged in biodiversity issues, aware of its value and taking positive action.</p> <p><b>Rationale:</b></p> <p>Public understanding and opinion on the value of biodiversity has strong implications for the acceptance and adoption of conservation measures.</p>
UK National Ecosystem Assessment (2011)	<p>A move to sustainable development will require an appropriate mixture of regulations, technology, financial investment and education, as well as changes in individual and societal behavior and adoption of a more integrated, rather than conventional sectoral, approach to ecosystem management. This will need the involvement of a range of different actors—government, the private sector, voluntary organisations and civil society at large...</p>
Natural Choice White Paper (HM Government 2011)	<p>We want more people to enjoy the benefits of nature by giving them freedom to connect with it. Everyone should have fair access to a good-quality natural environment. We want to see every child in England given the opportunity to experience and learn about the natural environment. We want to help people take more responsibility for their environment...</p>
A Green Future: Our 25 Year Plan for Nature (HM Government 2018)	<p>Spending time in the natural environment – as a resident or a visitor – improves our mental health and feelings of wellbeing. It can reduce stress, fatigue, anxiety and depression. It can help boost immune systems, encourage physical activity and may reduce the risk of chronic diseases such as asthma. It can combat loneliness and bind communities together.</p> <p>...Ideally, we would like access to the natural environment put at the heart of all local Health and Wellbeing Board</p>

strategies.

...Playing and learning outside is a fundamental part of childhood, and helps children grow up healthy. Some children are lucky enough to have a family garden; others will not and it is important that we find other ways to give them better access to the great outdoors. We know that regular contact with green spaces, such as the local park, lake, or playground, can have a beneficial impact on children's physical and mental health.

...Our goal is to see more people from all backgrounds involved in projects to improve the natural world. We will make 2019 a year of action for the environment, putting children and young people at its heart. This year of green action will provide a focal-point for organisations that run environmental projects, and will encourage wider participation.

...Evidence suggests that while many people are already keen to get out there and help the environment, we should aim for many more to do so.

...Government will build on the 70<sup>th</sup> anniversary of National Parks and the centenary of the Forestry Commission and #iwill campaign activities in 2019 to encourage adults and children to take positive steps to help the natural environment. We will focus on the simple things that people can do, and how these also support good health.

A series of public engagement activities for 2019 will link to initiatives on waste reduction, cleaner air or other aspects of pro-environmental behaviour. We will look to get the business community and voluntary sectors involved in these activities, and urge them, with the education sector, to develop their own initiatives throughout the year to engage communities and raise awareness.

We expect 2019 to be the foundation of a five-year programme that will help turn the commitments in this 25 Year Environment Plan into action.

## References

- Bragg, R. and G. Atkins (2016). A review of nature-based interventions for mental health care. Natural England Commissioned Reports, NECR204.  
<http://publications.naturalengland.org.uk/publication/4513819616346112>
- Capaldi CA, Dopko RL, Zelenski JM (2014). The relationship between nature connectedness and happiness: a meta-analysis. *Frontiers in Psychology* 5: 1–28.
- Department for Environment and Rural Affairs (DEFRA) (2011). Biodiversity 2020: a strategy for England's wildlife and ecosystem services. HMSO.
- HM Government (2010). Healthy Lives, Healthy People: our strategy for public health in England (Government White Paper). HMSO, London.  
<https://www.gov.uk/government/publications/healthy-lives-healthy-people-our-strategy-for-public-health-in-england>
- HM Government (2011). The Natural Choice: securing the value of nature. HMSO, London.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/228842/8082.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf)
- HM Government (2018). A Green Future: Our 25 Year Plan for Nature. HMSO, London.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/673203/25-year-environment-plan.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/673203/25-year-environment-plan.pdf)
- Natural England (2012). Health and Natural Environments: an evidence-based information pack. Natural England, Peterborough.  
[http://webarchive.nationalarchives.gov.uk/20140605142044/http://www.naturalengland.org.uk/Images/health-information-pack\\_tcm6-31487.pdf](http://webarchive.nationalarchives.gov.uk/20140605142044/http://www.naturalengland.org.uk/Images/health-information-pack_tcm6-31487.pdf)
- Natural England (2015). Monitor of Engagement with the Natural Environment (MENE), the national survey on people and the natural environment. 2013-14 Annual Report. Natural England, Peterborough.  
<http://publications.naturalengland.org.uk/publication/6579788732956672?category=47018>
- Natural England (2016). Evidence briefings on the links between natural environments and mental health, learning, obesity, physical activity, physiological health; connection to nature; methods and evaluation. EIN015–21,  
<http://publications.naturalengland.org.uk/category/6143124934492160>
- Secretariat of the Convention on Biological Diversity (2014a). Global Biodiversity Outlook 4. Montréal.
- Secretariat of the Convention on Biological Diversity (2014b). Global Biodiversity Outlook 4 — Summary and Conclusions. Montréal.
- UK National Ecosystem Assessment (2011). The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP–WCMC, LWEC, UK.

1 [http://unfccc.int/files/essential\\_background/background\\_publications\\_htmlpdf/application/pdf/conveng.pdf](http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf)

2 [http://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_paris\\_agreement.pdf](http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf)

3 <https://sustainabledevelopment.un.org>

## **Miller and others' original eight questions to ask**

In an article published in 2004, Brian Miller and colleagues proposed eight questions to ask of a museum/zoo/aquarium, to evaluate its nature conservation mission and activities. Nature conservation can be defined as 'a value-driven discipline based on the premise that the preservation of species diversity, ecological systems, and evolutionary processes in nature is important to the maintenance of life on our planet'. Such a position has since been embraced through the Sustainable Development Goals (Global Goals), an internationally agreed commitment to 'transform our world' by 2030, embracing environmental, social and economic sustainability. The eight questions are, with some of the explanation and rationale from Miller *et al.*'s article):

### **1. Does conservation thought define policy decisions?**

A mission of conservation means that conservation values are instilled directly into the decision-making process of the organization. With every decision, board members and administrators should ask themselves about the implications of this policy for nature.

### **2. Is there sufficient organisational funding for [nature] conservation activities?**

Does the institution claiming a mission of conservation actually put its money where its mouth is? Financial commitment includes both operating expenses allocated by the institution to conservation and income raised from outside sources for conservation. Inevitably, financial commitment defines policy.

### **3. Is there a functional [nature] conservation department?**

Having scientists on staff, or access to scientists through agreements with other institutions, is important for conducting or evaluating conservation projects. Collection-based institutions are also a popular source of information about the environment (Mench & Kreger 1996; Conway & Hutchins 2001), so a staff of trained professionals would support that image.

### **4. Does the institute advocate for [nature] conservation?**

Collection-based institutions have an important obligation to be advocates for and advise decision-makers about specific conservation issues (Conway 2000; Hutchins 2003). According to recent surveys by the Mellman Group and Roper, such institutions are a highly trusted source of information about the environment (Mench & Kreger 1996; Conway & Hutchins 2001), so they can play an influential role by bringing important issues to their local community through press conferences, public speaking, newspaper articles and editorials, magazine articles, and television.

### **5. Do [nature] conservation education programs [sic.] effectively target children and adults?**

Collection-based institutions should explore how they can move people to conserve nature. Each institution must take advantage of its special opportunities and the rapidly evolving techniques that are available. The outcome of education for conservation is the ultimate measure. Education can dispense facts and still have little impact on conservation (Reading 1993; Kellert *et al.* 1996).

To affect conservation, education needs to reinforce values and beliefs that have a positive effect on nature and change values and beliefs that have a negative effect on nature; the latter is extremely difficult (Williams 1979; Tessler & Shaffer 1990; Olson & Zanna 1993; Kellert 1996). Follow-up testing is important to gauge success and refine efforts (Jacobson 1999).

#### **6. Does the institution contribute directly to habitat protection locally and internationally?**

Some collection-based institutions provide direct financial assistance to parks, refuges, and reserves, and the adopt-a-park concept is growing... It is also important for the institution to act in the local community.

#### **7. Do exhibits explain and promote conservation efforts?**

Conway (2000:12) proposed three central questions for every new exhibit or master plan: "(1) If this exhibit were not built, would wildlife be hurt, helped, or unaffected? (2) Will it provide for the continuity of its inhabitants? (3) Will it contribute to species preservation in nature?" All three questions should be answered positively before an exhibit is installed. For example, will stocking [of a zoo/aquarium] an exhibit affect wild populations?

Exhibit planning and design teams profit from including a conservation biologist and a specialist in conservation education, and institutions increasingly are developing such collaborations. Exhibits can benefit conservation if they promote positive values and attitudes toward nature—attitudes that lead people to nurture instead of exploit or control nature. Exhibit graphics that provide more than isolated facts—that convey messages empowering people to become more active in conservation—are very beneficial. If exhibits cannot promote positive values toward nature, they are extremely difficult to justify as conservation education...

If the educational content of an exhibit is hidden in a context of domination, it can create as much harm as good. To that effect, Seidman (1992) of the Phoenix Zoo has posed an interesting question: What if a desire to be entertained by animals is part of the worldview that nature is simply a commodity to be exploited for our benefit?

#### **8. Do internal policies and activities protect the environment?**

Collection-based institutions often form internal committees to review operations and make recommendations for conserving resources. This can indirectly affect habitat because collection-based institutions can use large amounts of water, electricity, paper, food, energy, and other resources, and they can produce large amounts of waste. By reducing resource use and promoting such use through educational materials, collection-based institutions can be positive role models. The by-product of environmentally friendly actions is increased efficiency, often with associated monetary savings. So, being good conservationists within an institution can also mean good business.

## References:

- Conway, W., and M. Hutchins (2001). Introduction. Pages 1–7 in W. G. Conway, M. Hutchins, M. Souza, Y. Kapetanacos, and E. Paul (eds), *American Zoo and Aquarium Association field conservation research guide*. Wildlife Conservation Society, New York, and Zoo Atlanta, Atlanta.
- Jacobson, S. K. (1999). *Communication skills for conservation professionals*. Island Press, Washington DC.
- Kellert, S. R. (1996). *The value of life: biological diversity and human society*. Island Press, Washington DC.
- Kellert, S. R., M. Black, C. R. Rush, and A. J. Bath (1996). Human culture and large carnivore conservation in North America. *Conservation Biology* 10: 977–990.
- Mench, J. A., and M. D. Kreger (1996). Ethical and welfare issues associated with keeping wild animals in captivity. Pages 5–15 in D. G. Kleiman, M. E. Allen, K. V. Thompson, and S. Lumkin (eds), *Wild Mammals in Captivity: Principles and Techniques*. The University of Chicago Press, Chicago.
- Miller, B., W. Conway, R. P. Reading, C. Wemmer, D. Wildt, D. Kleiman, S. Monfort, A. Rabinowitz, B. Armstrong and M. Hutchins (2004). Evaluating the Conservation Mission of Zoos, Aquariums, Botanical Gardens, and Natural History Museums. *Conservation Biology* 18(1): 86–93.
- Olson, J. A., and M. P. Zanna (1993). Attitudes and attitude change. *Annual Review of Psychology* 44: 117–154.
- Reading, R. P. (1993). *Toward an Endangered Species Reintroduction Paradigm: a case study of the Black-footed Ferret*. Ph.D. dissertation. Yale University, New Haven, Connecticut.
- Seidman, M. (1992). Zoos and the psychology of extinction. *Wild Earth* 2(4): 64–69.
- Tessler, A., and D. R. Shaffer (1990). Attitudes and attitude change. *Annual Review of Psychology* 41: 479–523.
- Williams, R. M. (1979). Change and stability in values and value systems: a sociological perspective. Pages 15–46 in M. Rokeach (ed), *Understanding human values: individual and societal*. The Free Press, New York.

## **Methods**

An expanded set of questions was developed in 2017, based on Miller and colleagues' original eight questions. A Google Forms survey was created and promoted via Twitter and other social media, and to museum networks, including NatSCA (Natural Sciences Collections Association), NMDC (National Museum Directors' Conference), GEM (Group for Education in Museums) and others. A set of instructions explained the purpose of the survey; that responses were encouraged on a personal, individual, and consequently subjective basis; and that results would be grouped and not traceable to individuals.

### **Questions:**

**1a–k focus on the overarching connections between nature conservation/environmental sustainability and the museum sector, and individual museums' connections with related policies and strategies.**

**2a–b focus on museums' funding commitments to nature conservation/environmental sustainability.**

**3a–q focus on museums' staffing and commitment of staff resources to a variety of nature conservation/environmental sustainability related activities.**

**4a–c focus on museums' advocacy for nature conservation/environmental sustainability.**

**5a–h focus on museums' events and programmes for various audiences relating to nature conservation/environmental sustainability.**

**6a–c focus on direct contributions to nature conservation/environmental sustainability, through species protection and habitat provision/creation.**

**7a–d focus on nature conservation/environmental sustainability in exhibitions.**

**8a–g focus on museums' recent activities to reduce their negative environmental impact, and on their desire to be role models or leaders in relation to nature conservation/environmental sustainability.**

### **1. Uptake and spread of responses**

Responses were received from 74 individuals, from 42 museums, and 2 responses from 1 major heritage organisation/network responsible for many sites and collections through much of the UK (grouped in 'Trust/Independent').

## 2. Geographical spread and governance types

Museum type	Number of responses	Number of museums from which responses received
England	68	39
Scotland	2	2
Wales	4	1
UK-wide	2	1
Local authority	24	18
Trust/ Independent	16	14
University	25	5
National	11	6

## 3. Museum types

	Number of responses	Number of museums
Natural heritage only	9	5
Human heritage only	6	6
Natural and human heritage only	19	5
Human heritage and art only	1	1
Art only	6	2
Natural heritage, human heritage and art	35	25
Natural heritage total	63	34
Human heritage total	61	37
Art total	42	28

In terms of museum types, the majority of responses came from museums that included natural heritage collections. While perhaps unsurprising, this suggests three things. Firstly, that many museums include natural heritage collections. Secondly, that museums (and museum workers) that do not cover natural heritage disciplines do not see themselves as connecting with nature conservation. Thirdly, that museums that cover natural heritage disciplines could usefully play a leadership role in encouraging those in other museum types (and in their own organisations) to connect their work with nature conservation.

#### 4. Role types

	Collect ions care/m anage ment	Collectio ns-based research	Supporti ng collectio ns-based research	Supporti ng school pupils' learning	Manage ment	Developi ng exhibitio ns	Events/lif elong learning/ outreach /visitor services
Local authority	13	3	4	4	6	6	7
Trust/ Independent	3	3	4	6	2	4	7
University	9	1	3	2	3	6	9
National	4	3		1	4	1	
Heritage organisation					2		
<b>Total</b>	<b>29</b>	<b>10</b>	<b>11</b>	<b>13</b>	<b>17</b>	<b>17</b>	<b>23</b>

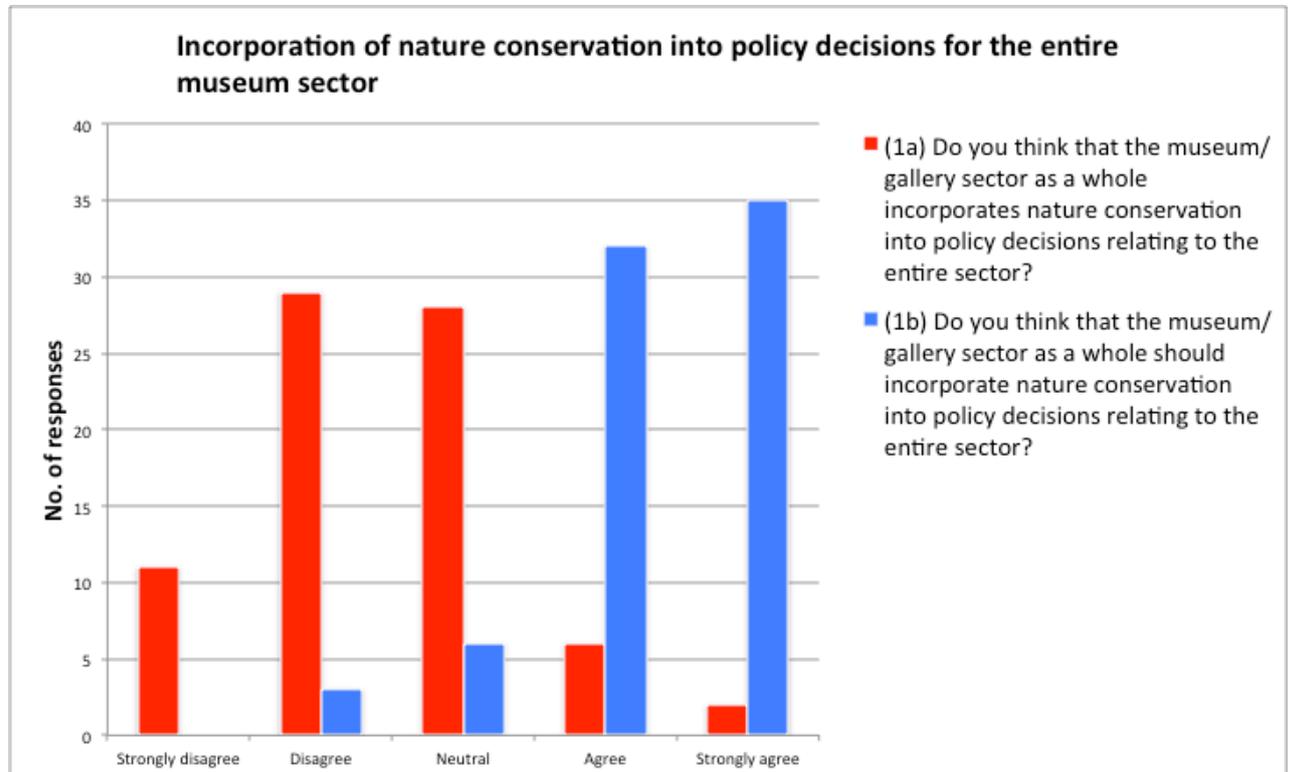
Contact was made with one network that declined to promote the survey to its members as it could not see the relevance, in spite of their network being responsible for decisions that have a significant environmental impact through travel.

#### 5. Cautionary note

As response was entirely voluntary, it is reasonable to assume that responses were more likely to come from those positively/constructively engaged with the connection between museums and the natural environment. Consequently, this study should be regarded as a straw poll, rather than a representative overview of museums and the natural environment. Readers should bear in mind that responses throughout this survey are likely to represent the 'more engaged' end of the museum spectrum, and that the overall picture of support for nature conservation and environmental sustainability is likely to be weaker. Nonetheless, the results are worth inspection, in the absence of a representative overview, and to consider the questions being asked.

**(1a) Do you think that the museum/gallery sector as a whole incorporates nature conservation into policy decisions relating to the entire sector?**

**(1b) Do you think that the museum/gallery sector as a whole should incorporate nature conservation into policy decisions relating to the entire sector?**

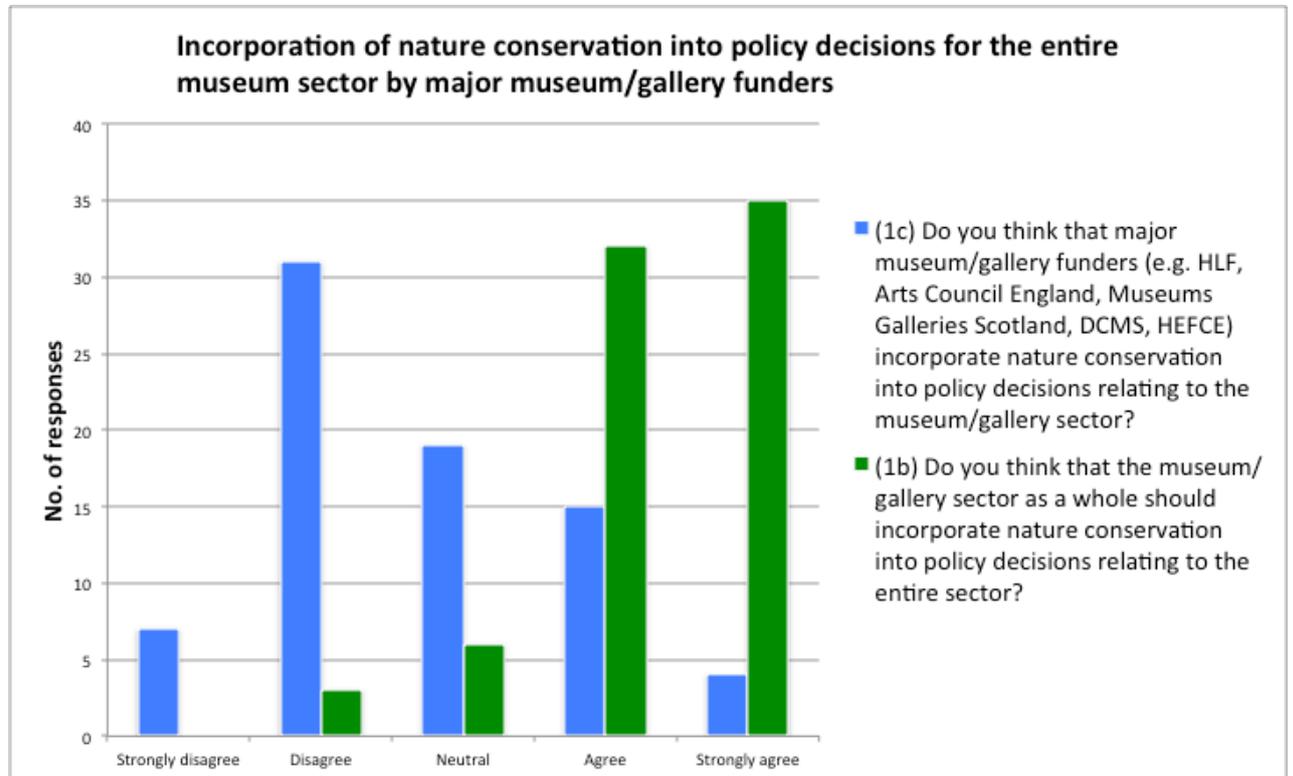


There was a strong response that the museum/gallery sector does not incorporate nature conservation into policy decisions relating to the entire sector.

There was an even stronger response that the museum/gallery sector should incorporate nature conservation into policy decisions relating to the entire sector.

**(1b) Do you think that the museum/gallery sector as a whole should incorporate nature conservation into policy decisions relating to the entire sector?**

**(1c) Do you think that major museum/gallery funders (e.g. HLF, Arts Council England, Museums Galleries Scotland, DCMS, HEFCE) incorporate nature conservation into policy decisions relating to the museum/gallery sector?**



There was a strong response that major funders do not incorporate nature conservation into policy decisions relating to the entire museum sector, contrasting strongly with the position that respondents felt the sector should incorporate into policy decisions.

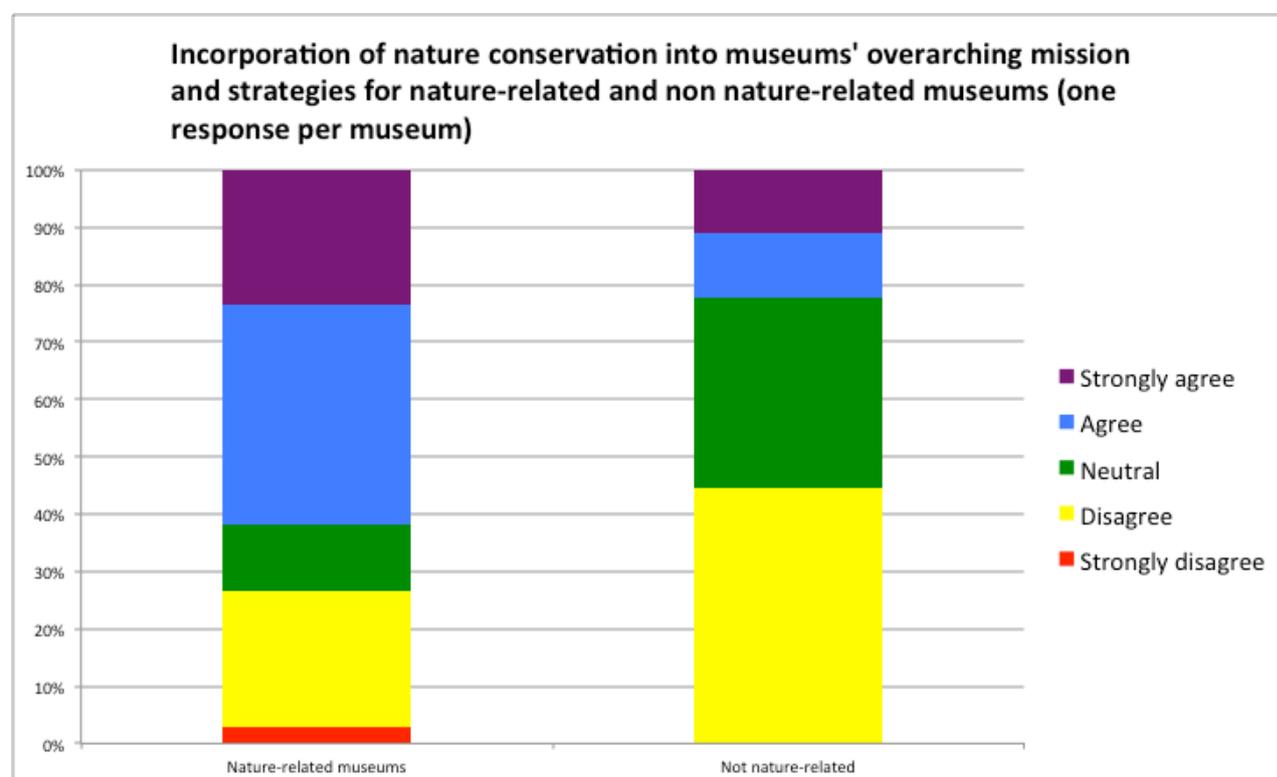
**(1d) Does your museum/gallery incorporate nature conservation (either through direct impacts on nature or in terms of its collections and engagement) into its overarching mission and strategies?**

	No. of responses	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
Nature-related museums	63	1	13	12	22	15	3.63 (1.07)
Not nature-related	13	0	4	4	2	3	3.31 (1.18)
Local authority	24	0	8	7	6	3	3.17 (1.05)
Trust/Independent	16	1	5	1	6	3	3.31 (1.30)
University	25	0	1	4	8	12	4.24 (0.88)
National	11	0	3	4	4	0	3.09 (0.83)

Respondents from nature-related museums responded more strongly that their museums incorporated nature conservation into their museums' overarching mission and strategies: 60% of respondents from nature-related museums strongly agreed or agreed that their museums incorporated nature conservation, compared with 33% of respondents from non nature-related museums.

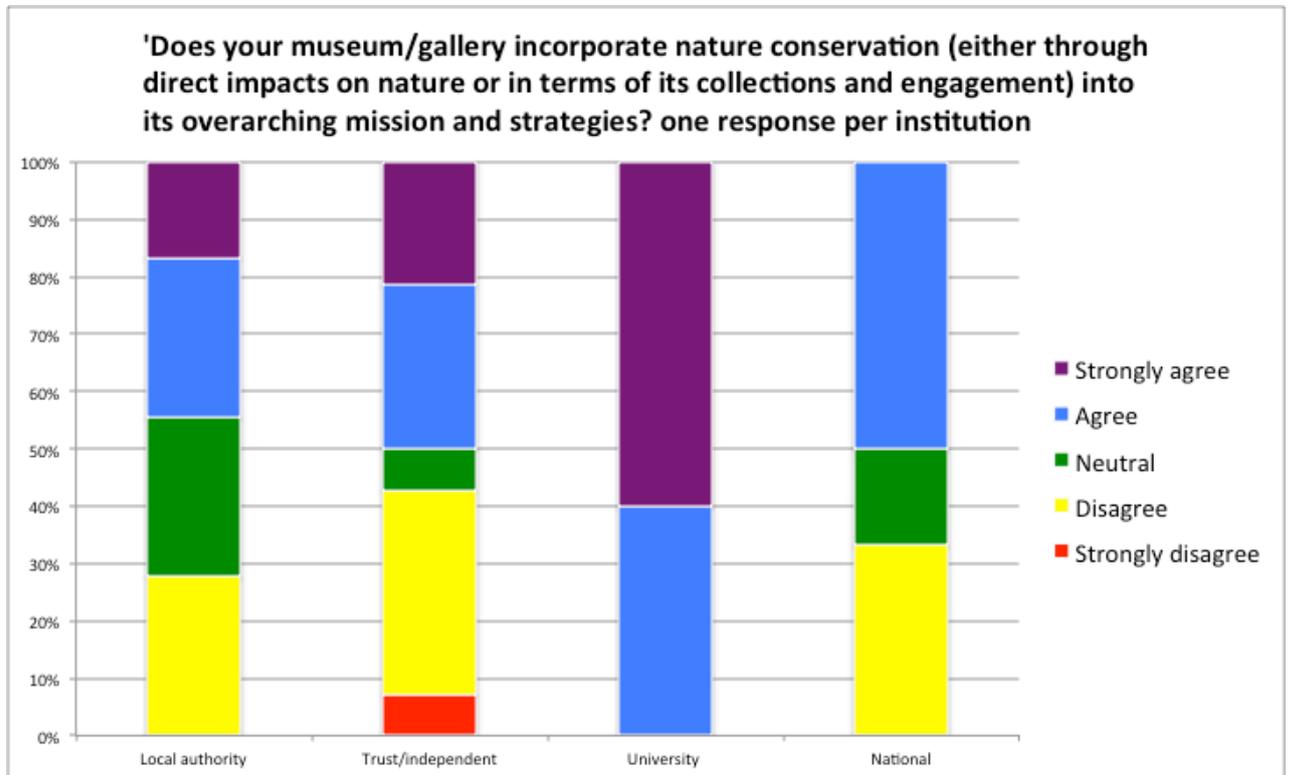
**(1d) Does your museum/gallery incorporate nature conservation (either through direct impacts on nature or in terms of its collections and engagement) into its overarching mission and strategies?**

	No. of institutions	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
Nature-related museums	34	1	8	4	13	8	3.56 (1.19)
Not nature-related	9		4	3	1	1	2.89 (1.05)
<b>Local authority</b>							
Local authority	18		5	5	5	3	3.33 (1.08)
<b>Trust/Independent</b>							
Trust/Independent	14	1	5	1	4	3	3.21 (1.37)
<b>University</b>							
University	5				2	3	4.60 (0.55)
<b>National</b>							
National	6		2	1	3		3.17 (0.98)



To accommodate differing numbers of responses from some institutions, one response per institution was used; where differing scores were given for the same institution by different respondents, the highest score was used. The same overall picture was found, with stronger

agreement that nature conservation was considered in overarching mission and strategies in nature-related museums.

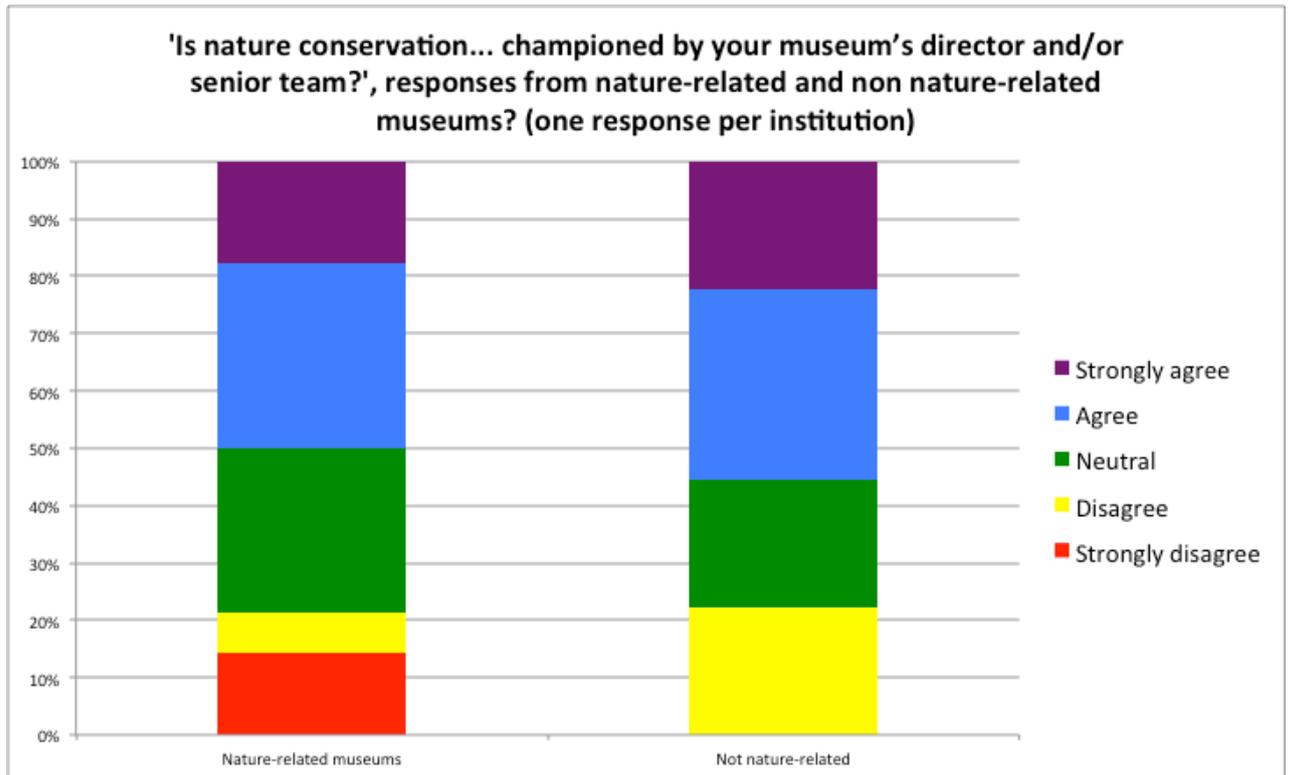


To accommodate differing numbers of multiple responses from some institutions, one response per institution was used; where differing scores were given for the same institution by different respondents, the highest score was used. University museum workers responded more strongly that their museums incorporated nature conservation into their overarching mission and strategies, while respondents from national museums were least likely to agree that their museums supported nature conservation.

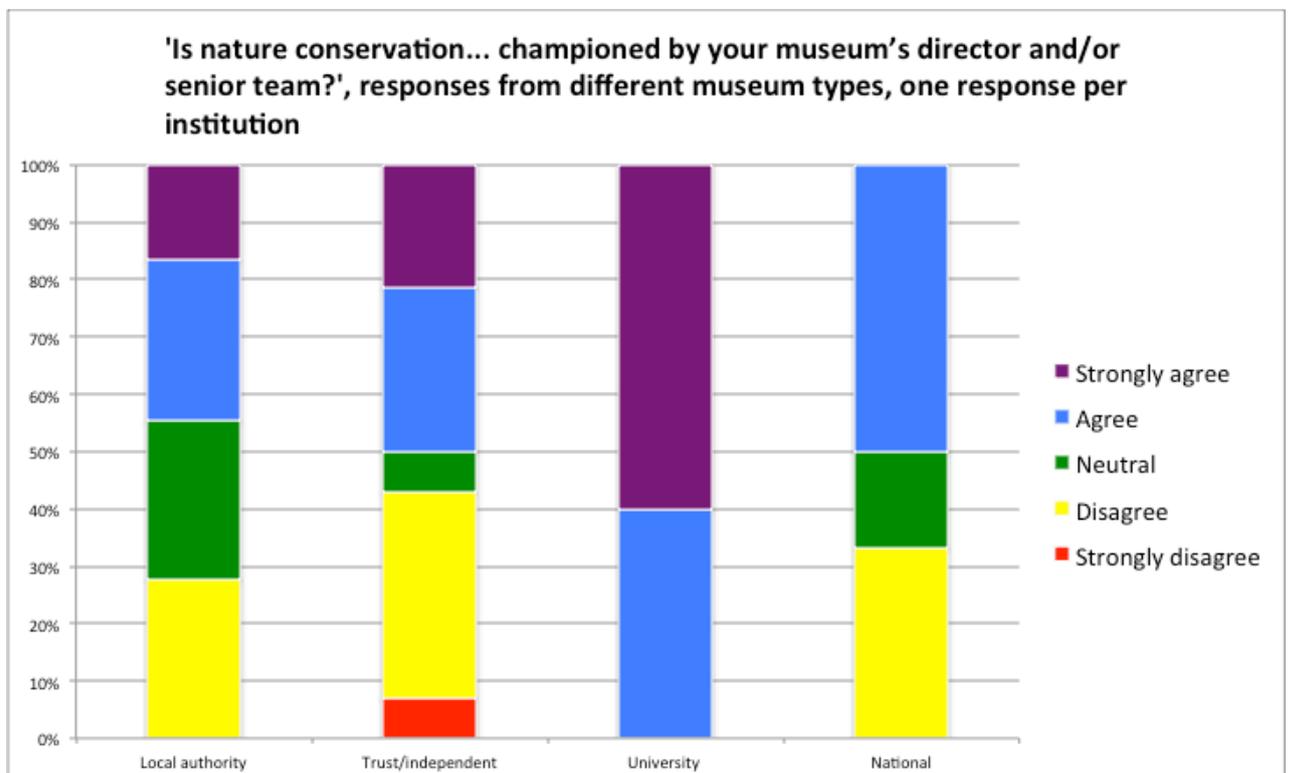
**(1f) Is nature conservation (environmental sustainability, wildlife conservation, climate change action) championed by your museum's director and/or senior team?**

	No. of responses	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
Nature-related museums	63	8	8	14	16	17	3.41 (1.35)
Not nature-related	13	0	2	2	4	5	3.92 (1.1)
Local authority	24	2	6	7	7	2	3.04 (1.12)
Trust/Independent	16	4	3	1	5	3	3.00 (1.55)
University	25	1	0	3	4	17	4.44 (1.00)
National	11	1	1	5	4	0	3.09 (0.94)

	No. of institutions	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
Nature-related museums	34	4	2	8	9	5	3.24 (1.35)
Not nature-related	9		2	2	3	2	3.56 (1.13)
Local authority	18	2	3	5	6	2	3.17 (1.20)
Trust/Independent	14	4	2	1	5	2	2.93 (1.54)
University	5			1		4	4.60 (0.89)
National	6			3	3		3.50 (0.54)



There was no clear difference between nature-related museums and non nature-related museums in terms of the extent to which respondents felt nature conservation was championed by their museums' directors and senior teams.

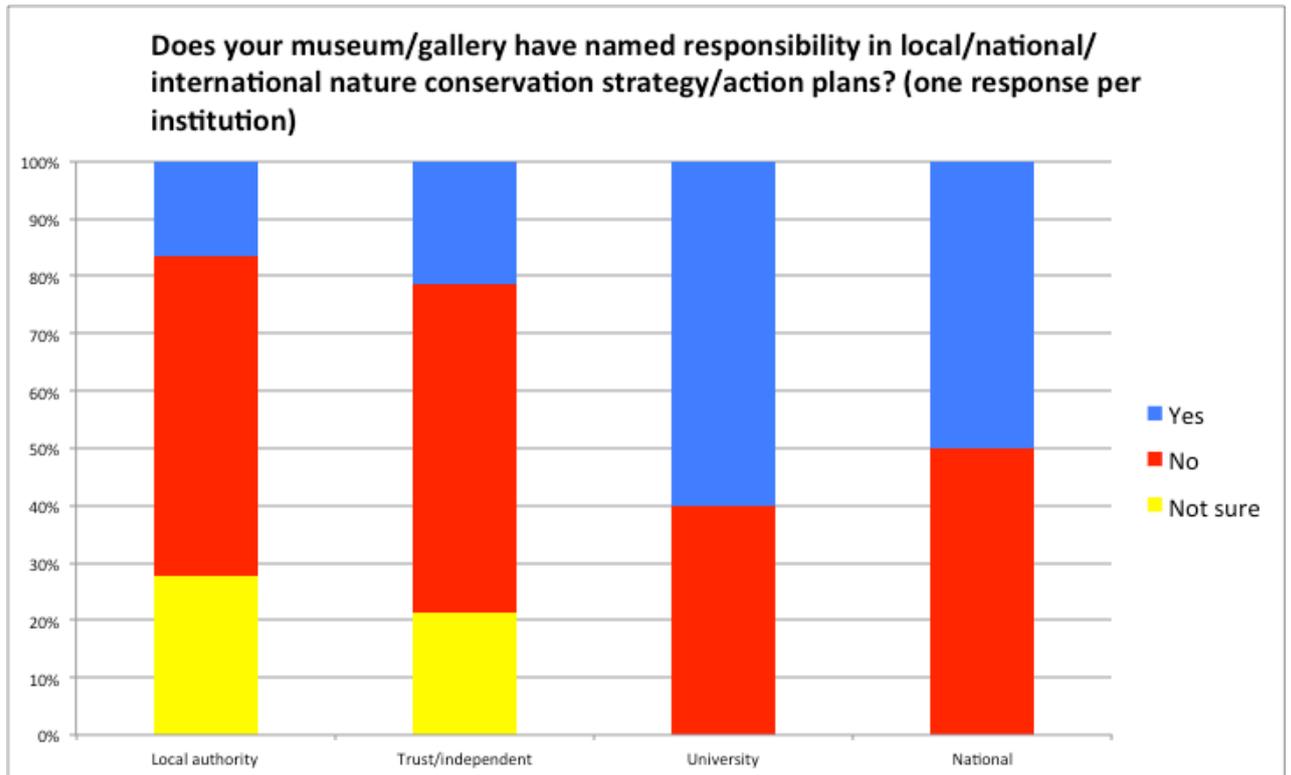


There were clear differences in the extent to which nature conservation was championed when responses from those working in different museum types were compared. There was little

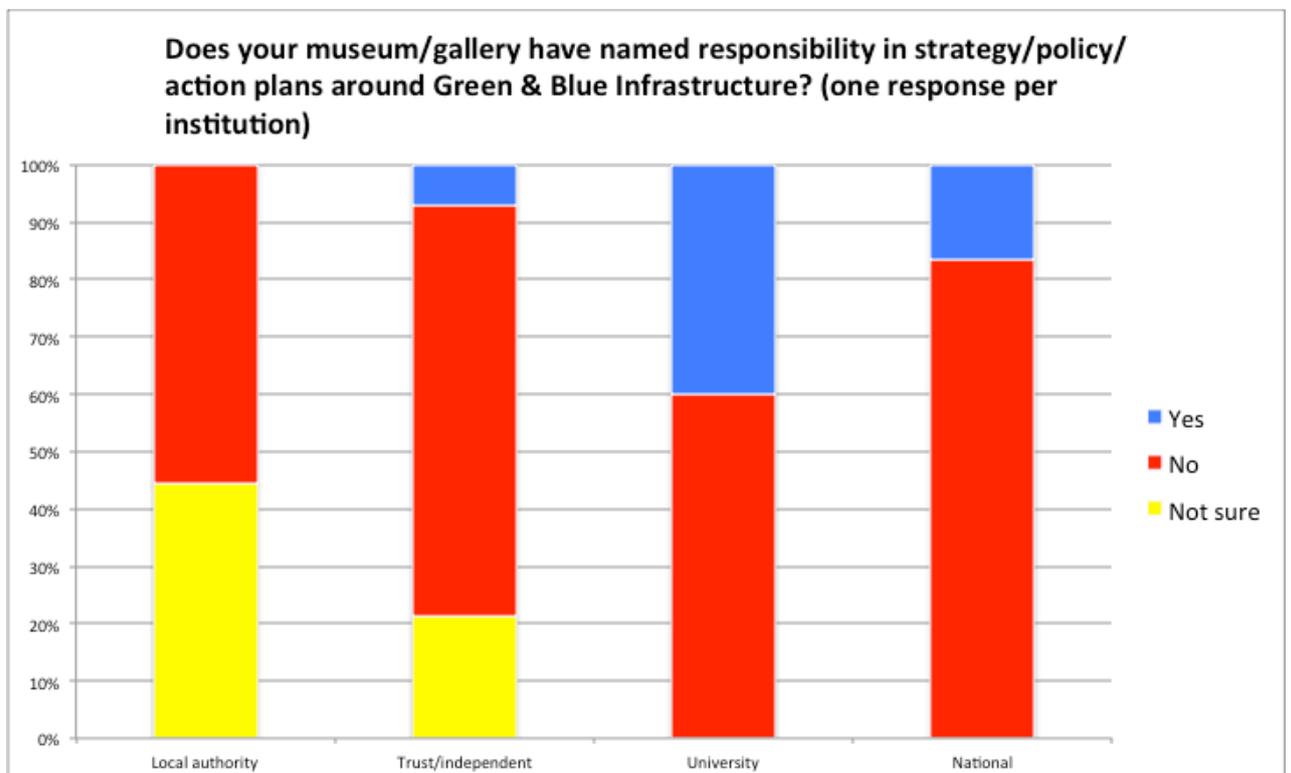
difference between local authority museums and trusts/independents. Respondents from university museums agreed more strongly that their director/senior teams championed nature conservation, while respondents from national museums were least likely to agree (strongly agree and agree) that their director/senior team championed nature conservation.

**(1g) Responses on respondees' museums' named responsibilities within different nature-conservation related strategies and action plans**

		No of museums	Yes	No	Not sure
Nature conservation strategy/action plans	Local authority	18	3	10	5
	Trust/independent	14	3	8	3
	University	5	3	2	
	National	6	3	3	
Green and Blue infrastructure	Local authority	18		10	8
	Trust/independent	14	1	10	3
	University	5	2	3	
	National	6	1	5	
Climate change strategy/action	Local authority	18	3	10	5
	Trust/independent	14	2	12	
	University	5	2	3	
	National	6	1	5	
Nature and wellbeing strategy/action	Local authority	18	2	11	5
	Trust/independent	14	2	9	3
	University	5	3	2	
	National	6	2	4	

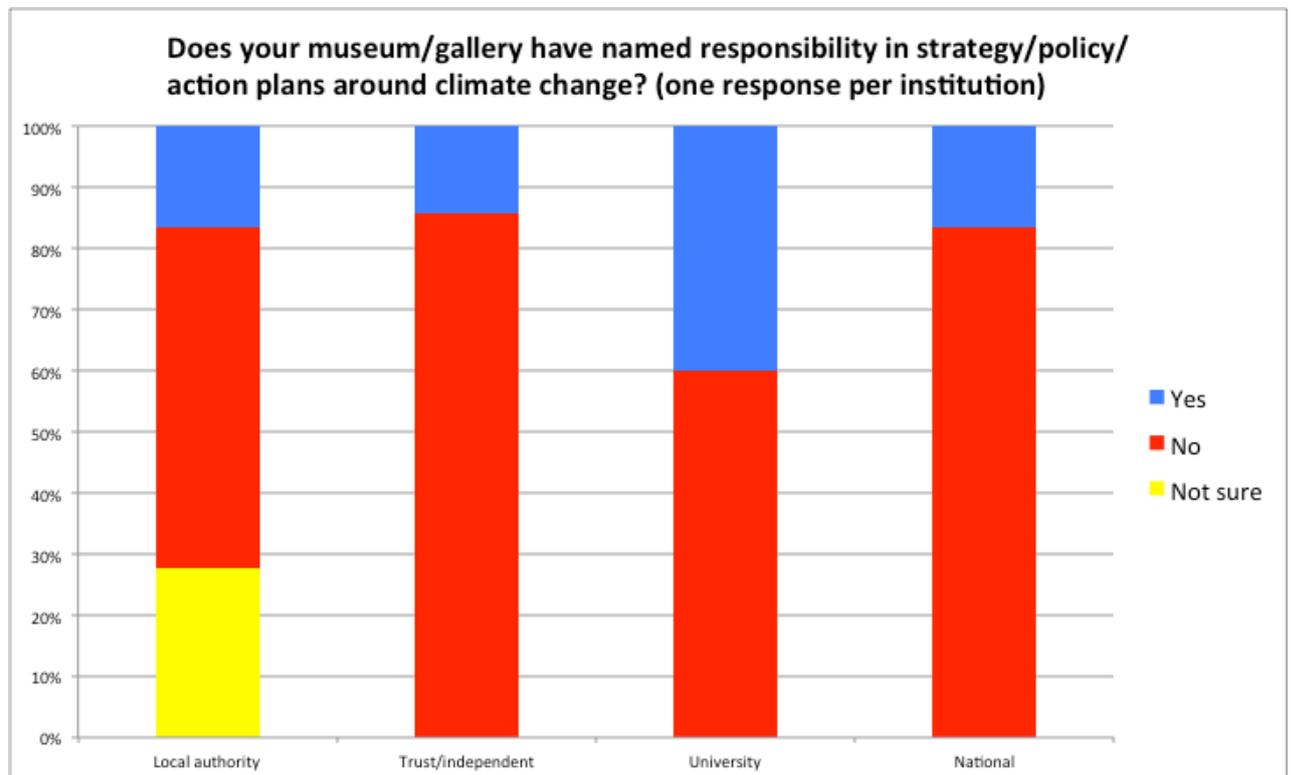


There were strong differences between respondents from university museums and national museums, when compared with local authority and trust/independents, in terms of having named responsibility in strategies/action plans around nature conservation.

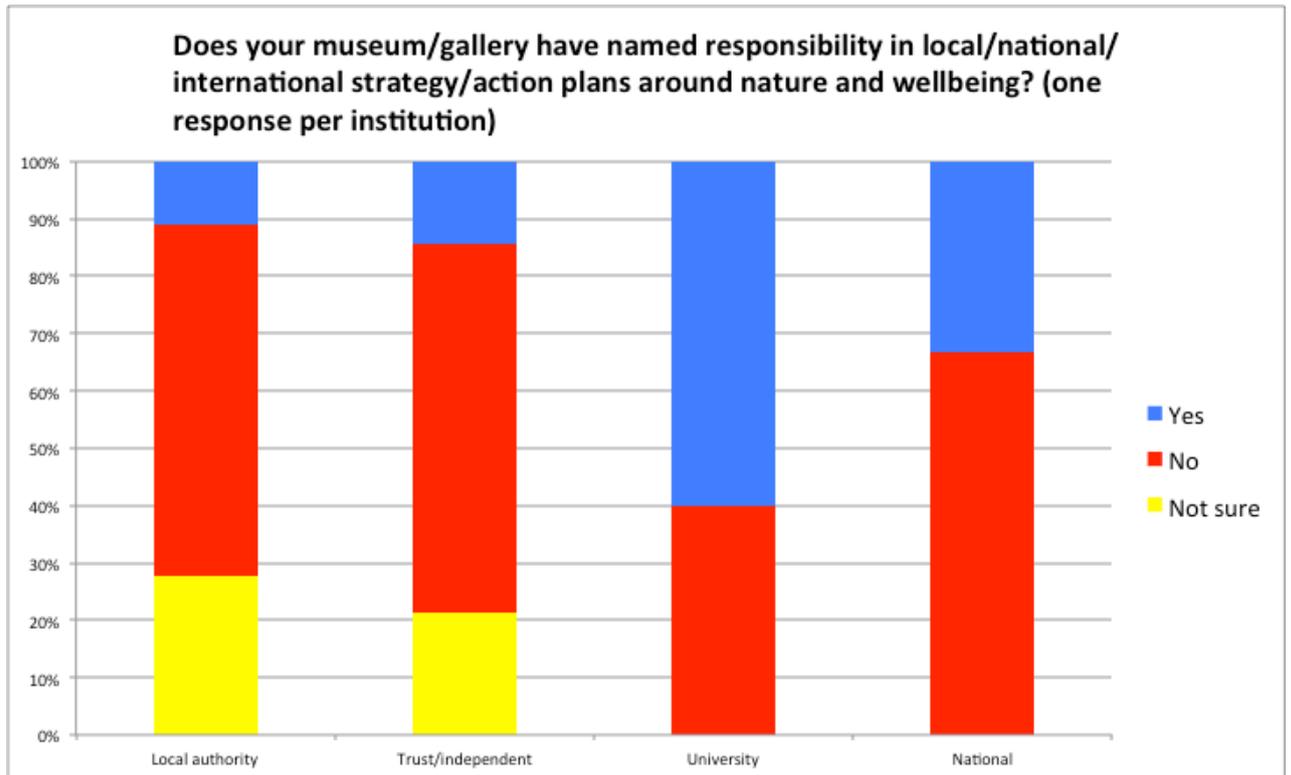


While responses around green and blue infrastructure followed the same general pattern as found for nature conservation, more respondents were not sure on whether or not their

museums had responsibility around green and blue infrastructure, again suggesting that internal communications could improve this situation.



The same general pattern was found for responses from different museum types in terms of their named responsibility in climate change strategy/action, with some difference between university museums (higher positive response) and other museum types, but little difference between other museum types.



The same general pattern was found as for the questions on museum workers perceptions of their museums' named responsibilities around nature conservation and climate change action.

**1h) How important do you think it is that your museum/gallery connects with species conservation, in its operations and programming?**

**(1i) How important do you think it is that your museum/gallery connects with climate change action, in its operations and programming?**

**(1j) How important do you think it is that your museum/gallery connects with protecting endangered habitats, in its operations and programming?**

**(1k) How important do you think it is that your museum/gallery models good behaviour in terms of nature conservation and environmental sustainability?**

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
How important do you think it is that your museum/gallery connects with...						
Species conservation	3	2	4	19	48	4.41 (1.00)
Climate change action	0	0	3	23	50	4.62 (0.56)
Protecting endangered habitats	0	1	7	22	46	4.49 (0.72)
How important do you think it is that your museum/gallery models good behaviour in terms of nature conservation and environmental sustainability?						
	0	0	3	18	56	4.68 (0.55)

Overall, there was a strong response in favour of connecting museums' activities with nature conservation and environmental sustainability.

**1h) How important do you think it is that your museum/gallery connects with species conservation, in its operations and programming?**

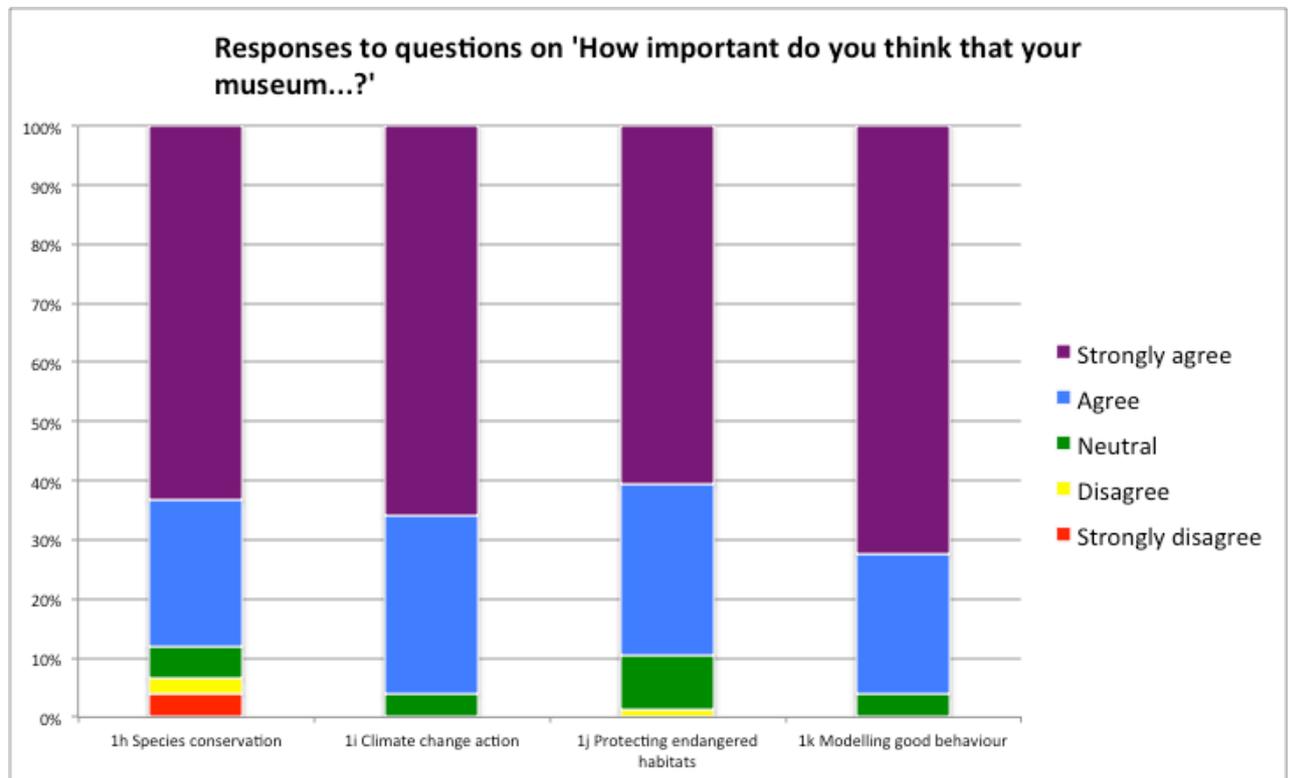
**(1i) How important do you think it is that your museum/gallery connects with climate change action, in its operations and programming?**

**(1j) How important do you think it is that your museum/gallery connects with protecting endangered habitats, in its operations and programming?**

**(1k) How important do you think it is that your museum/gallery models good behaviour in terms of nature conservation and environmental sustainability?**

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
How important do you think it is that your museum/gallery connects with...						
Species conservation						
Responses from nature-related museums	1	1	2	15	44	4.58 (0.76)
Responses from other museums	2	1	2	4	4	3.54 (1.45)
Climate change action						
Responses from nature-related museums	0	0	1	21	41	4.63 (0.52)
Responses from other museums	0	0	2	2	9	4.54 (0.78)
Protecting endangered habitats						
Responses from nature-related museums	0	0	3	16	44	4.65 (0.57)
Responses from other museums	0	1	4	6	2	3.69 (0.85)
How important do you think it is that your museum/gallery models good behaviour in terms of nature conservation and environmental sustainability?						
Responses from nature-related museums	0	0	2	16	45	4.68 (0.53)
Responses from other museums	0	0	1	2	10	4.69 (0.63)

A stronger positive response came from those working in museums with natural heritage collections in terms of species conservation and protecting endangered habitats. The strongest positive response, from all museum types, was in support of climate change action. Responses from all museum types considered modelling good behaviour in terms of nature conservation and environmental sustainability to be very important.



Responses to these four questions were very similar, with strong responses in favour of supporting species conservation, climate change action and protecting endangered habitats in museums' operations and programming. Respondents also responded strongly that museums should model good behaviour in terms of nature conservation and environmental sustainability. Contrast these results with responses to questions 1a–c.

**(2a) Does your organisation commit funding internally towards activities that can support nature conservation/environmental sustainability in some way?**

	No. of museums	Positive responses (no. of museums)	Positive responses as %
<b>Staffing</b>			
Local authority	18	4	22.2
Trust/independent	14	7	50.0
University	5	4	80.0
National	6	5	83.3
<b>Exhibitions</b>			
Local authority	18	12	66.7
Trust/independent	14	8	57.1
University	5	4	80.0
National	6	6	100.0
<b>Events</b>			
Local authority	18	13	72.2
Trust/independent	14	8	57.1
University	5	5	100.0
National	6	6	100.0
<b>Activities for schools</b>			
Local authority	18	11	61.1
Trust/independent	14	9	64.3
University	5	5	100.0
National	6	5	83.3
<b>Community engagement</b>			
Local authority	18	9	50.0
Trust/independent	14	8	57.1
University	5	5	100.0
National	6	5	83.3

There was a stronger response that university and national museums (as opposed to local authority and trusts/independents) commit resources related to nature conservation/environmental sustainability in terms of staffing, events, activities for schools and community engagement.

	No. of museums	Positive responses (no. of museums)	Positive responses as %
Staffing			
Nature-related museums	34	20	58.8
Other museums	9	2	22.2
Exhibitions			
Nature-related museums	34	17	50.0
Other museums	9	3	33.3
Events			
Nature-related museums	34	28	82.4
Other museums	9	4	44.4
Activities for schools			
Nature-related museums	34	27	79.4
Other museums	9	3	33.3
Community engagement			
Nature-related museums	34	25	73.5
Other museums	9	2	22.2

Nature-related museums committed more resources to nature conservation/environmental sustainability in terms of staffing, events, activities for schools and community engagement.

**(2b) Does your organisation fund-raise for activities drawing on its support for nature conservation?**

There were 22 positive responses to this question, from 14 museums (29% of responses, 33% of museums). There were a further 23 'not sure' responses. Of the 22 positive responses, 21 were museums with natural heritage collections.

**(3a) Does your museum/gallery have collections that could support nature conservation research (conservation of wild places and species)?**

There were 67 positive responses to this question, from 37 museums (88% of responses, 86% of museums), of all museum types; 32 of these were museums with natural heritage collections.

**(3b) Approximately how many specimens/objects (i.e. how many natural heritage specimens/objects are there)?**

**(3c) What groups do these belong to?**

Respondents came from most of the major UK museums with natural heritage collections: respondents' museums included c.113 million natural heritage specimens/objects, with 80 million in the Natural History Museum, 16.5 million in other National museums, 12 million in university museums, 5.3 million in local authority museums, and 2.5 million in trust/independent museums.

A further 19.25 million natural heritage specimens/objects are to be found in major collections that did not make a response to this survey (including e.g. major herbaria not in museums), and it is likely that a further 2–5 million are to be found in smaller museums.

This gives an overall total figure of approximately 137 million natural heritage specimens/objects in UK museum collections, including preserved vertebrates (mounts, skins, skeletons, spirit), invertebrates (spirit, pinned, dried), rocks/minerals, fossils, plants and fungi. Museums also house large numbers of e.g. biological and geological records, diaries, archives, field notes, images and illustrations.

**(3d) Does your museum/gallery still collect objects/specimens relating to these groups?**

The majority of respondents from museums with natural heritage collections reported that their museums continue to collect natural heritage specimens/objects of all kinds.

**(3e) Does your museum/gallery employ people who are educated/trained/have worked in nature conservation and/or with environmental issues to care for/interpret collections?**

The majority of respondents reported that their museums employ people educated/trained/have worked in nature conservation and/or with environmental issues to interpret collections (26 museums, 60%), however, when this figure is examined more closely, it shows that 19 of these are museums with natural heritage collections. This means that slightly more than half (56%) of museums with natural heritage collections employ people educated/trained/have worked in nature conservation and/or with environmental issues to care for/interpret collections, while 44% do not or were unsure.

**(3f) Does your museum/gallery employ people who are educated/trained/have worked in nature conservation and/or with environmental issues to engage with school students?**

A slightly lower proportion of respondents reported that their museums employ people educated/trained/have worked in nature conservation and/or with environmental issues to engage with school students (21 museums, 49%); of these, 18 were museums with natural heritage collections. This also means that half (53%) of museums with natural heritage collections

employ people educated/trained/have worked in nature conservation and/or with environmental issues to engage with school students, while 47% do not or were unsure.

**(3g) Has your museum/gallery specified interest and/or commitment to nature conservation and environmental sustainability in job advertisements (not necessarily in all job adverts)?**

Only 7 museums/galleries (16% of responses; 3 national museums, 3 university museums/galleries and one heritage organisation) had specified an interest and/or commitment to nature conservation and environmental sustainability in job advertisements. However responses from a further 10 museums/galleries were 'not sure', suggesting that internal communication could develop a better shared understanding on this topic. Of these, 6 were museums with natural heritage collections, meaning that 18% of museums with natural heritage collections had specified an interest and/or commitment to nature conservation and environmental sustainability in job advertisements, while 82% had not or were unsure.

**(3h) Has your museum/gallery recruited volunteers specifying an interest in nature conservation and/or environmental sustainability?**

A larger number of museums/galleries had recruited volunteers specifying an interest in nature conservation and/or environmental sustainability (19 museums/galleries, 44%). Of these, 14 were museums with natural heritage collections, meaning that 41% of museums with natural heritage collections had specified an interest in nature conservation/environmental sustainability when recruiting volunteers, while 59% had not or were unsure.

**(3i) Does your museum/gallery employ staff to enable research by others on collections in support of nature conservation and/or environmental sustainability?**

Twenty-eight museums/galleries reported that they employ staff to enable research by others on collections in support of nature conservation and/or environmental sustainability (65% of museums/galleries). Of these, 20 were museums with natural heritage collections, meaning that 59% of museums with natural heritage collections employ staff to enable research by others on collections in support of nature conservation/environmental sustainability, while 41% do not or were unsure.

**(3j) Does your museum/gallery support staff time to prepare collections, and make collections-information available, in support of nature conservation and/or environmental sustainability?**

A similar number (29, 67%) of museums/galleries reported that they support staff time to prepare collections, and make collections information available, in support of nature conservation and/or environmental sustainability. Of these, 21 were from museums with natural heritage collections, meaning that 62% of museums with natural heritage collections support staff time to prepare collections, and make collections-information available in support of nature conservation/environmental sustainability, while 38% do not or were unsure.

**(3k1) Does your museum/gallery support staff time to participate in nature conservation and/or environmental sustainability-related activities outside the museum? [Field collecting]**

Respondents from 15 museums/galleries (35% of museums) reported that their museums/galleries support staff time to undertake field collecting. Of these, 18 were museums with natural heritage collections, meaning that 53% of museums with natural heritage collections support staff time to participate in field collecting related to nature conservation/environmental sustainability, while 47% do not or were unsure.

**(3k2) Does your museum/gallery support staff time to participate in nature conservation and/or environmental sustainability-related activities outside the museum? [Field work and surveys]**

Respondents from 19 museums (44% of museums) reported that their museums/galleries support staff time to participate in field work and surveys outside their museum. Of these, 15 were museums with natural heritage collections, meaning that 44% of museums with natural heritage collections support staff time to participate in field work and surveys related to nature conservation/environmental sustainability, while 56% do not or were unsure.

**(3k3) Does your museum/gallery support staff time to participate in nature conservation and/or environmental sustainability-related activities outside the museum? [Habitat restoration]**

A small number (9, 21%) of museums/galleries reported that they support habitat restoration outside the museum/gallery. Of these, 8 were museums with natural heritage collections, meaning that 24% of museums with natural heritage collections support staff time to participate in habitat restoration related to nature conservation/environmental sustainability, while 76% do not or were unsure.

**(3k4) Does your museum/gallery support staff time to participate in nature conservation and/or environmental sustainability-related activities outside the museum? [Habitat creation]**

A slightly higher number (12, 28% of museums) of museums reported that they support habitat creation outside the museum/gallery. Of these, 10 were museums with natural heritage collections, meaning that 29% of museums with natural heritage collections support staff time to participate in habitat creation related to nature conservation/environmental sustainability, while 71% do not or were unsure.

**(3l) Does your museum/gallery support university or college education on nature conservation and/or environmental sustainability related activities?**

A significant proportion of museums (26, 60% of museums) reported that they support university or college education on nature conservation and/or environmental sustainability related activities. Of these, 24 of these were museums with natural heritage collections, meaning that 71% of museums with natural heritage collections support university or college education on

nature conservation/environmental sustainability related themes, while 29% do not or were unsure.

**(3m) Do staff deliver higher/further education student teaching on nature conservation and/or environmental sustainability related activities?**

Some museums (14, 33% of museums) reported that staff deliver higher/further education student teaching on nature conservation and/or environmental sustainability related activities, notably within the university and national museums that responded. Of these, 13 of these were museums with natural heritage collections, meaning that 38% of museums with natural heritage collections deliver higher/further education student teaching on nature conservation/environmental sustainability related themes, while 62% do not or were unsure. Of the 14 positive respondents, 4 were national museums, 5 were university museums, 4 were local authority museums and 1 was a trust/independent.

**(3n) In the last five years, has your museum/gallery supported traineeships, internships or placements that incorporated nature conservation and/or environmental sustainability related activities?**

Some museums (17, 40% of museums) reported that they had supported traineeships, internships or placements incorporating nature conservation and/or environmental sustainability in the last five years. Of these, 15 of these were museums with natural heritage collections, meaning that 44% of museums with natural heritage collections had supported internships or placements that incorporated nature conservation/environmental sustainability, while 56% had not or were unsure.

**(3o) Has your museum/gallery and its collections contributed directly to research publications relating to nature conservation and/or environmental sustainability (whether authored by museum staff or external researchers)?**

A significant proportion of museums (24, 56%) reported that they have contributed directly to research publications relating to nature conservation and/or environmental sustainability. Of these, 23 were museums with natural heritage collections, meaning that 68% of museums with natural heritage collections had contributed directly to research publications relating to nature conservation/environmental sustainability, while 32% had not or were unsure.

**(3p) Approximately how many publications a year relate to nature conservation/environmental sustainability in some way (for your entire museum/gallery)**

Most museums were unsure how many research publications relating to this subject were produced in a year, although this number would probably number in the 100s, if not low 1,000s overall.

**(3q) In the last 5 years, has your museum/gallery supported/enabled nature conservation and/or environmental sustainability projects by external partners (e.g. Wildlife Trusts, RSPB)?**

	<b>Positive responses (no. of institutions)</b>	<b>% of all institutions</b>	<b>Positive responses from museums with natural heritage collections</b>	<b>% of museums with natural heritage collections</b>
Access to specimens/objects/collections	27	63%	24	71%
Contributed towards exhibitions	24	56%	20	59%
Took part in events in the museum/gallery	32	74%	26	76%

Many museums/galleries support the work of nature conservation/environmental sustainability projects by external partners, notably by providing opportunities for partners to take part in events.

**(4a) Does your organisation raise awareness of issues relating to nature conservation/environmental sustainability at a policy/strategic level (i.e. in the city/region/nationally/internationally?)**

Some museums (19, 43%) reported that they raise awareness of issues relating to nature conservation/environmental sustainability at a policy/strategic level. Of these, 17 were museums with natural heritage collections, meaning that 50% of museums with natural heritage collections raise awareness of issues relating to nature conservation/environmental sustainability at a policy/strategic level, while 50% do not or are not sure.

**(4b) Does your organisation provide a public platform for organisations working with local/regional/national/international policy or strategy relating to nature conservation/environmental sustainability?**

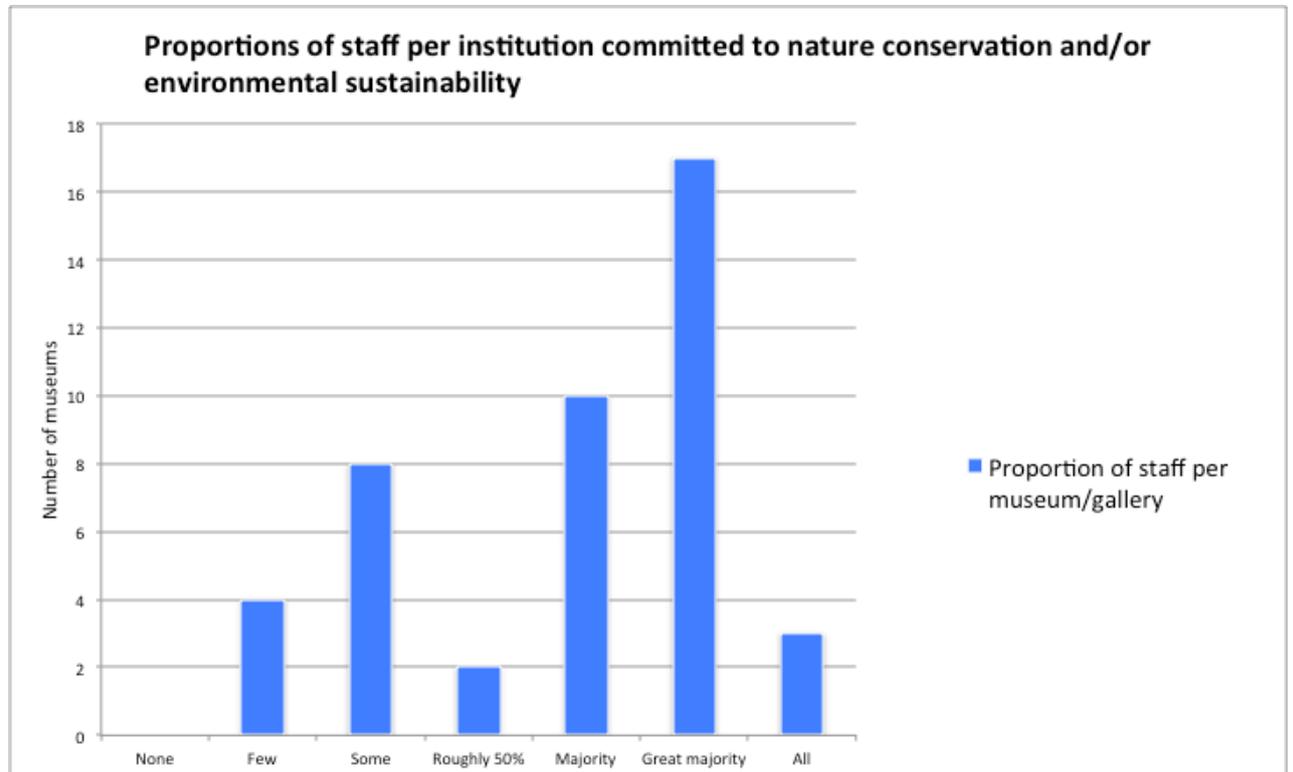
The same number (19, 43%) provide a public platform for organisations working with nature conservation/environmental sustainability policy and strategy. The same number (17) were museums with natural heritage collections, meaning that 50% of museums with natural heritage collections raise awareness of issues relating to nature conservation/environmental sustainability at a policy/strategic level, while 50% do not or are not sure.

**(4a) and (4b)**

There was a very high degree of overlap between museums responding positively to questions 4a and 4b, with 15 museums responding positively to both questions. Of these, 14 were museums with natural heritage collections, meaning that 50% of museums with natural heritage collections

both raise awareness of issues and provide a public platform for organisations working with nature conservation/environmental sustainability.

**(4c) Would you say that staff are, in general, committed to nature conservation and/or environmental sustainability?**



Staff in most ('all', 'great majority', 'majority') museums/galleries from which responses were received were committed to nature conservation and/or environmental sustainability.

**(5a–e) Does your museum/gallery hold public events in support of nature conservation and/or environmental sustainability, or promoting people's connection with nature, for... ?**

	No. of museums/galleries	%
<b>Museums with natural heritage collections</b>	<b>34</b>	
Non-specialist adults	28	82.4%
Specialist adults	15	44.1%
People over 60	9	26.5%
Families/children	29	85.3%
Schools	19	55.9%
<b>Other museums</b>	<b>9</b>	
Non-specialist adults	4	44.4%
Specialist adults	1	11.1%
People over 60	1	11.1%
Families/children	4	44.4%
Schools	3	33.3%

Unsurprisingly, most museums with natural heritage collections provided events/programmes on nature conservation and/or environmental sustainability, or promoting people’s connection with nature for a wide variety of audiences. However, the proportion offering programmes for specific audiences varied greatly. Most museums’ programmes were fairly general, aimed at ‘non-specialists’ and families. However, a number of museums with natural heritage collections do not make use of them in programmes, possibly in relation to nature conservation and/or environmental sustainability, or at all.

5a. Examples of activities for Non-specialist adults: public events linked to OPAL projects; open days with talks from curators; store tours on the role of the museum in nature conservation; RSPB-led activities; events showing people how to compost and make gardens bee-friendly; Bat Week activities with the Bat Trust; surveying, bug-hunts and invasive plant bashing; events linked to international days (Earth Day, World Oceans Day); public events and debates linked to environmentally themed exhibitions, and themes around sustainability; exhibitions on environmental themes targeted towards adults; open days with partner conservation organisations (Wildlife Trusts, RSPB etc); partnership projects with e.g. Wildlife Trusts, conservation groups that include public engagement and access to collections; consultation events on environmental topics with the public and local policy makers, and with academics.

5b. Examples of activities for Specialist adults: ‘Natural World’ workshops; training days for naturalists with e.g. local entomological societies, mammal groups; events for Biological Recorders’ groups; providing leaflets to the public on specialist subjects produced by e.g. geological sciences groups; supporting RIGS and other special interest groups; advanced

identification in entomology and osteology; occasional events linked with exhibitions; participation in local nature festivals; mothing evening, bird identification walks; providing opportunities for local enthusiasts/experts to volunteer and talk with the public; pond-dipping with local Wildlife Trust; several museums reported that this is at a lower level than for non-specialists. [It is worth noting that many museums with natural heritage collections provide volunteering opportunities for people with a keen interest and specialism in nature.]

5c. Examples of activities specifically for People over 60: supporting requests from external groups, e.g. University of the Third Age, Age Concern; 'Meet the Curator' sessions for groups over 60; 'Encountering The Unexpected' project in partnership with University of Leicester, nature conservation groups and successful ageing specialists; walks in the park; specialised health and wellbeing programmes linked with dementia; 'Age of Nature' group.

5d. Examples of activities for Families/children: pop-up exhibition on ocean acidification; family events and open days; bioblitzes involving public engagement at a number of museums; 'Little Green Museum' storytelling and events; pop-up museums in the landscape with natural heritage collections/objects from the area; solstice events in the landscape; talks to local community groups; Bug Club; pond-dipping, birdwatching and Big Garden Birdwatch, Bee Day; Wellie Walks; family workshops on endangered species, using objects seized by HM Customs in public events; fossil roadshows; craft sessions; Invitation to Wildlife events; moth trapping; '50 Things to do Before You're 11 ¾'; 'Green Sundays' events with a local Wildlife Trust, using collections, and the local park; 'Nature Explorers' festival; 'Nature Discovery' gallery.

5e. Examples of activities for Schools: school 'Spring Bulbs' activities; natural sciences sessions for different KS levels; interactive gallery; specialist sessions in galleries, or in specific learning spaces; workshops on climate change, evolution, taxonomy, identification etc.; BSA Crest science workshop for schools exploring biodiversity; invasive plant bashing; pond dipping, insect studies; schools programmes drawing on vivaria and aquaria in museums; 'Sustainability Summer School'; 'Habitat Explorer' sessions ( KS1), 'Animal Explorer' sessions ( under 5's) , 'Rainforest Explorer' programme ( KS2); A-Level annual conference on Biodiversity linked to UN Decade of Biodiversity; environmental art; minibeasts sessions, Features of Creatures sessions; workshops and activities which encourage school children to engage and learn about their natural surroundings, its importance and value to our own survival; partnership programme with Natural England; collaborations with Forest Schools; 'Percy the Park-keeper' sessions;

**(5f) In the last five years, has your museum/gallery been involved in citizen science projects in support of nature conservation and/or environmental sustainability?**

19 museums/galleries had supported citizen science projects in the last five years, with projects including Zooniverse projects, Big Garden Birdwatch, OPAL (Open Air Laboratories) projects, promoting and enabling wildlife recording, supporting training courses and recording with local biological records centres, identification workshops for biological recorders, Turing's Sunflowers projects on Fibonacci numbers, programmes with the National Biodiversity Network, bioblitzes ,iRecord, iSpot, Swift City (with RSPB), surveying Waxcap fungi, Big Butterfly Count. Of these, 16 were museums with natural heritage collections, meaning 47% of museums with natural heritage collections had been involved in citizen science projects in support of nature conservation/environmental sustainability and 53% had not.

**(5g) In terms of your museum/gallery's engagement around nature and environmental sustainability (in exhibitions and programmes), would you say your museum/gallery's focus was to...: (one response per institution, using the highest score for each, with 'always uses' highest, 'avoids' lowest; 'not sure' not scored)**

	Always uses	Sometimes uses	Sometimes avoids	Avoids	Not sure	Score <sup>1</sup>	Rank <sup>2</sup>
Let the public know about nature conservation/environmental issues	10	28	0	1	5	124	1
Communicate the severity of environmental challenges	4	26	3	3	8	100	5
Communicate nature conservation successes and opportunities	6	26	1	1	10	104	3
Sign-post the public towards nature conservation activities to take part in	8	24	2	3	7	108	2
Encourage the public to think creatively about dealing with environmental challenges	5	26	2	2	9	102	4
Connect visitors' choices and actions with impacts (local and global)	4	20	1	4	15	78	7
Give the public opportunities to respond/share their ideas/opinions	6	21	5	3	9	97	6

1. Score = ('always uses' x 4)+('sometimes uses' x 3)+('sometimes avoids' x 2)+('avoids' x 1); 'not sure' was not scored
2. Rank = rank order of Score, highest score = 1

**(5h) Which of these approaches do you think are most successful in promoting public action around nature conservation/environmental sustainability?**

**All responses:**

	Very successful	Successful	Not very successful	Not sure	Score <sup>1</sup>	Rank <sup>2</sup>
Let the public know about nature conservation/environmental issues	10	46	6	14	128	4
Communicate the severity of environmental challenges	4	34	12	26	92	7
Communicate nature conservation successes and opportunities	20	41	3	12	145	1
Sign-post the public towards nature conservation activities to take part in	20	38	0	18	136	3
Encourage the public to think creatively about dealing with environmental challenges	15	36	4	21	121	6
Connect visitors' choices and actions with impacts (local and global)	16	35	6	19	124	5
Give the public opportunities to respond/share their ideas/opinions	17	43	3	13	140	2

3. Score = ('very successful' x 3)+('successful' x 2)+('not very successful' x 1); 'not sure' was not scored.

4. Rank = rank order of Score, highest score = 1

In terms of promoting public action, respondents felt communicating conservation successes and opportunities, giving the public opportunities to respond/share their ideas/opinions, and sign-posting the public towards nature conservation activities to take part in were the most successful

approaches, while connecting visitors' choices and actions with impacts (local and global), encouraging the public to think creatively about dealing with environmental challenges and communicating the severity of environmental challenges were the least successful approaches.

There was a reasonable agreement between how respondents considered their museums/galleries to approach engagement around nature conservation and environmental sustainability, and approaches they felt were effective (comparing the ranks for questions 5g and 5h). Although respondents considered providing the public with opportunities to respond/share their ideas and opinions as being important (overall rank of 2), it was not considered to form an important feature of museum/gallery engagement (score 6). This is a clear mismatch, and I suggest that museums/galleries incorporate more such opportunities to promote more effective engagement on nature conservation/environmental sustainability issues.

In fact, there is a place for all of these approaches, and the main point is that they are deployed appropriately. However, focussing on possibilities, options, creativity and personal choice and action are plausibly more effective and preferable to simply telling people about depressing things they can do nothing about (which is disempowering), or simply providing information, which does not necessarily lead to action (and can actually inhibit action if used inappropriately). Providing opportunities to raise people's collective awareness of what other people think about and care about is also extremely important, and an opportunity (indeed a much-needed one) for cultural institutions in society.

If we consider engagement as an ongoing state of connectedness, rather than a time-bound activity that takes places in a museum/gallery, engagement consists of cognitive (thinking), affective (emotional) and behavioural (action) elements around a particular topic: the thinking, feeling and doing that people do in their daily lives in relation to particular issues or discourses. Working with people to consider what they know, what they care about and what they do, in a dialogical and aligned, rather than linear, way, represents a plausible model for what we mean when we talk about 'empowerment' and promoting people's ongoing, constructive engagement with the natural environment. This involves supporting people to consider what they think to be important, knowing what their choices and the impacts of those choices are, understanding what will support positive feelings and help reduce negative feelings, connect with what they are motivated to do, and act upon the things they care about.

Note that all seven approaches impact on all of cognitive, affective and behavioural impacts, although some are more clearly focussed on one or more impacts than others.

**(6a) Does your museum/gallery contribute directly to habitat/species conservation and/or environmental sustainability worldwide, for example by providing funding and/or supporting particular species protection programmes?**

Respondents from 14 museums/galleries reported that their institutions had contributed directly to habitat/species conservation, although very few had provided funding for conservation programmes, but had contributed through providing staff time and expertise for e.g. report writing and assessments, leading a national programme on endangered freshwater mussels in rivers, and for captive-breeding programmes in vivaria and aquaria. However, providing access to collections as part of research programmes on species conservation. Of these, 9 were museums with natural heritage collections, meaning 26% of museums with natural heritage collections contribute directly to nature conservation/environmental sustainability worldwide, while 74% had not.

**(6b) Does your museum/gallery work in partnership with nature conservation projects directed towards habitat creation/protection locally?**

Respondents from 21 museums/galleries (49% of museums; 18 of them museums with natural heritage collections) reported that their institutions work in partnership with nature conservation projects directed towards habitat creation/protection locally. Examples included insect surveys of reclaimed colliery spoil tips; working with the Woodland Trust on the protection of local woodlands; providing training for specialist groups prior to undertaking organised surveys; working in support of local Biodiversity Action Plans with partners; working with canal conservation groups; working in international project teams; generally supporting work of local conservation groups through participating in networks, hosting meetings, providing access to collections, supporting public engagement; worked with local friends group to build drystone wall for small mammals, and creating hay meadows; working with partners to improve local park; coastal sand dune conservation work with partners; working with consortia of partners to improve local lowland peat bogs, including community engagement, public engagement and habitat restoration. This means 53% of museums with natural heritage collections work in partnership with nature conservation projects directed towards habitat creation/protection locally

**(6c) Does your museum provide habitat/support for non-human species, e.g. in parks, grounds, allotments, bee-hives?**

Respondents from 31 museums/galleries (73%; 24 of them museums with natural heritage collections, 56% of museums with natural heritage collections) reported their institutions provide habitat/support for non-human species (e.g. in parks, grounds, allotments, bee-hives). As many museums/galleries are in city centre and town centre locations, this means that museums/galleries can play an important role in both providing habitat for animals/plants, and also provide people with access to nature. As the Multiple Index of Deprivation incorporates access to nature as a measure, providing access to nature helps to alleviate Deprivation.

**(7a) Does your museum/gallery contain permanent galleries featuring nature conservation (either as an underlying theme, or a section within a gallery) (these don't need to have been developed within the last five years)?**

Of the 43 museums/galleries from which responses were received, 30 responded 'yes', 11 'no' and 2 'not sure'. Of those museums with natural heritage collections, 26 (76%) responded that they contain permanent galleries featuring nature conservation in some way.

**(7b) Is support for nature conservation/environmental sustainability considered to be a key intended outcome of your permanent galleries (some or all)?**

Of the 43 museums/galleries from which responses were received, 24 responded 'yes', 8 responded 'no', 5 responded 'not sure'. Of the 24 positive responses, 20 were museums with natural heritage collections, representing 60% of such museums.

**(7c) Approximately how many of your special/temporary exhibitions feature/reference nature in some way? (1= none, 5= all)**

	No. of museums	1	2	3	4	5	Mean (SD)
Natural heritage only	5	1				4	4.20 (1.79)
Natural and human heritage/art	29	7	10	8	3	1	2.34 (1.08)
Human heritage/art only	9	5	1	3			1.78 (0.97)

The main thing to note from the table above is that, in museums with mixed natural/human heritage/art collections, nature is referenced relatively infrequently in special/temporary exhibitions.

**(7d) Is support (not necessarily financial support) for nature conservation considered to be a key intended outcome of your special/temporary exhibitions that relate to nature/nature conservation?**

Of the 43 museums/galleries from which responses were received, 17 responded 'yes', 17 responded 'no', 9 responded 'not sure'. Of the 17 positive responses, all 17 were museums with natural heritage collections.

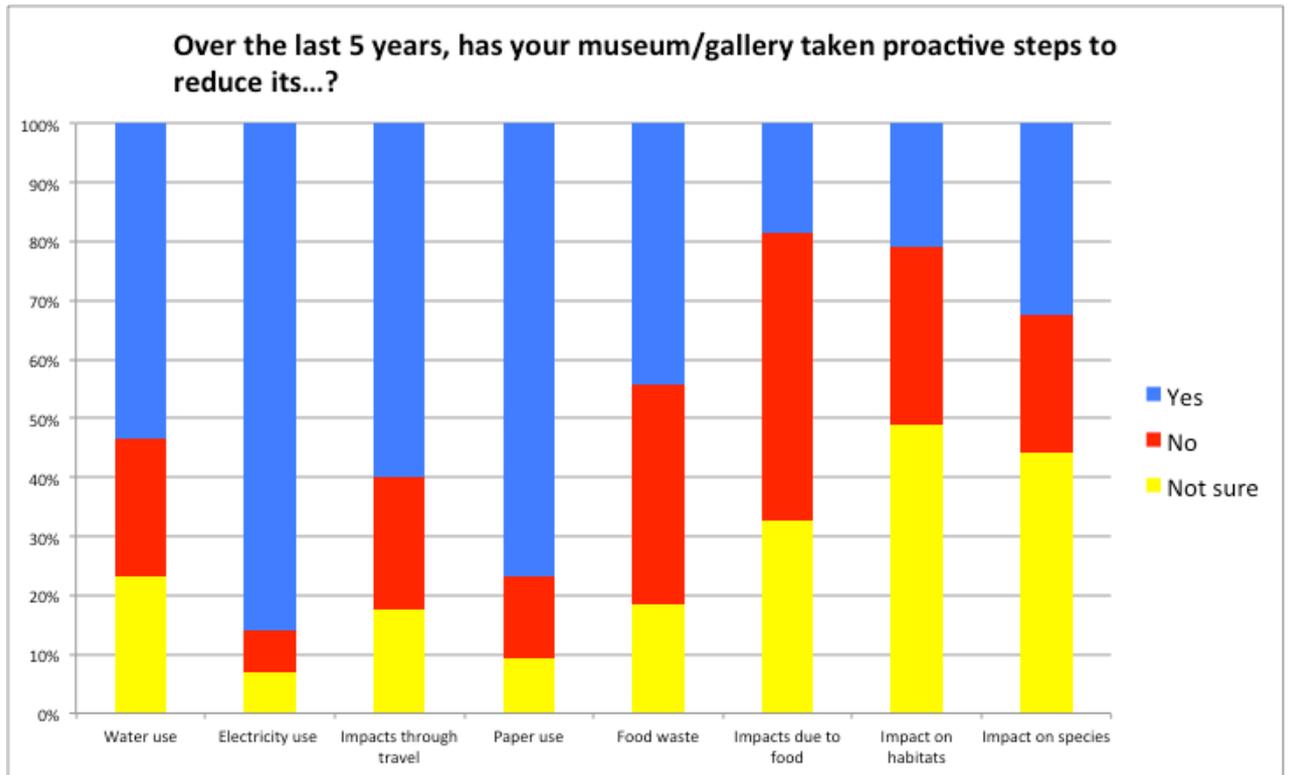
**(8a) Over the last 5 years, has your museum/gallery taken proactive steps to reduce its...?**

		No of museums	Yes as %	No as %	Not sure as %
Water use	Local authority	18	28%	28%	44%
	Trust/independent	14	71%	14%	14%
	University	5	40%	60%	0%
	National	6	100%	0%	0%
	<b>All</b>	<b>43</b>	<b>53%</b>	<b>23%</b>	<b>23%</b>
Electricity use	Local authority	18	83%	6%	11%
	Trust/independent	14	86%	7%	7%
	University	5	80%	20%	0%
	National	6	100%	0%	0%
	<b>All</b>	<b>43</b>	<b>86%</b>	<b>7%</b>	<b>7%</b>
Impacts through travel	Local authority	18	56%	17%	28%
	Trust/independent	14	43%	43%	14%
	University	5	80%	20%	0%
	National	6	67%	33%	0%
	<b>All</b>	<b>43</b>	<b>56%</b>	<b>28%</b>	<b>16%</b>
Paper use	Local authority	18	78%	17%	6%
	Trust/independent	14	71%	14%	14%
	University	5	80%	20%	0%
	National	6	83%	0%	17%
	<b>All</b>	<b>43</b>	<b>77%</b>	<b>14%</b>	<b>9%</b>
Food waste	Local authority	18	50%	28%	22%
	Trust/independent	14	36%	50%	14%
	University	5	60%	40%	0%
	National	6	33%	33%	33%
	<b>All</b>	<b>43</b>	<b>44%</b>	<b>37%</b>	<b>19%</b>
Environmental impacts due to food (meat, dairy)	Local authority	18	11%	61%	28%
	Trust/independent	14	14%	36%	50%
	University	5	60%	40%	0%
	National	6	17%	50%	33%

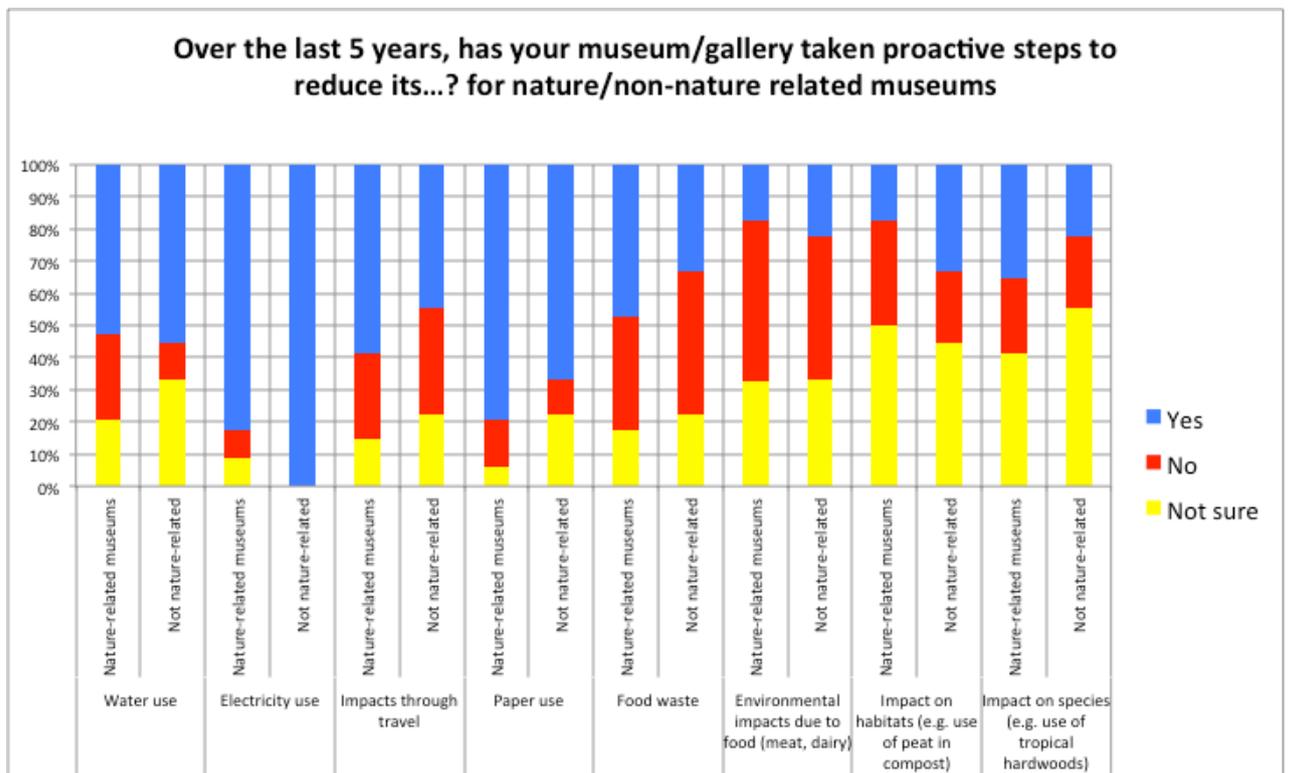
	<b>All</b>	<b>43</b>	19%	49%	33%
Impact on habitats (e.g. use of peat in compost)	Local authority	18	17%	50%	33%
	Trust/independent	14	21%	14%	64%
	University	5	60%	20%	20%
	National	6	0%	17%	83%
	<b>All</b>	<b>43</b>	21%	30%	49%
Impact on species (e.g. use of tropical hardwoods)	Local authority	18	28%	28%	44%
	Trust/independent	14	21%	21%	57%
	University	5	80%	20%	0%
	National	6	33%	17%	50%
	<b>All</b>	<b>43</b>	33%	23%	44%

**(8a) Over the last 5 years, has your museum/gallery taken proactive steps to reduce its...?**

		No. of museums	Yes	No	Not sure
Water use	Nature-related museums	34	53%	26%	21%
	Not nature-related	9	56%	11%	33%
Electricity use	Nature-related museums	34	82%	9%	9%
	Not nature-related	9	100%	0%	0%
Impacts through travel	Nature-related museums	34	59%	26%	15%
	Not nature-related	9	44%	33%	22%
Paper use	Nature-related museums	34	79%	15%	6%
	Not nature-related	9	67%	11%	22%
Food waste	Nature-related museums	34	47%	35%	18%
	Not nature-related	9	33%	44%	22%
Environmental impacts due to food (meat, dairy)	Nature-related museums	34	18%	50%	32%
	Not nature-related	9	22%	44%	33%
Impact on habitats (e.g. use of peat in compost)	Nature-related museums	34	18%	32%	50%
	Not nature-related	9	33%	22%	44%
Impact on species (e.g. use of tropical hardwoods)	Nature-related museums	34	35%	24%	41%
	Not nature-related	9	22%	22%	56%



There were strong differences between the proportions of museums/galleries that had taken proactive steps to reduce different environmental impacts, with the highest proportions reducing impacts through electricity use (but note no question was asked about the sources of electricity, whether from renewable or non-renewable/fossil fuel sources) and paper use, and lowest proportions addressing impacts due to food or on habitats.



There was no clear difference between nature and non-nature related museums in terms of the management of their environmental impacts.

**(8b) Does your museum/gallery aim to be a role model in terms of supporting nature conservation and/or environmental sustainability?**

	No. of institutions	Yes	% Yes	No	% No	Not sure	% Not sure
Nature-related museums	34	17	50%	11	32%	6	18%
Not nature-related	9	4	44%	3	33%	2	22%
<b>All museums</b>	<b>43</b>	<b>21</b>	<b>49%</b>	<b>14</b>	<b>33%</b>	<b>8</b>	<b>19%</b>
Local authority	18	8	44%	7	39%	3	17%
Trust/Independent	14	7	50%	4	29%	3	21%
University	5	3	60%	2	40%		
National	6	4	67%	1	17%	1	17%

There was little apparent difference between nature and non-nature related museums in terms of the extent to which they considered themselves to be role models in support of nature conservation or environmental sustainability. More National and University museums aimed to be role models in support of nature conservation or environmental sustainability.

**(8c) Does your museum/gallery aim to be a leader in terms of supporting nature conservation and/or environmental sustainability?**

	No. of institutions	Yes	% Yes	No	% No	Not sure	% Not sure
Nature-related museums	34	12	35%	17	50%	5	15%
Not nature-related	9	2	22%	6	67%	1	11%
<b>All museums</b>	<b>43</b>	<b>14</b>	<b>33%</b>	<b>23</b>	<b>53%</b>	<b>6</b>	<b>14%</b>

Local authority	18	4	22%	11	61%	3	17%
Trust/ Independent	14	5	22%	6	61%	3	17%
University	5	3	60%	2	40%		
National	6	2	33%	4	67%		

Responses to this question showed a weaker response than to question 8b, with fewer museums aiming to be leaders than role models around nature conservation or environmental sustainability. 'Leader' was not defined in the question, and it could be worthwhile for museums to consider what they consider to define environmental leadership, as opposed to being a role model. As museums reach large numbers of people, simply behaving as a role model is a form of leadership.

**(8d) Has your museum won or been shortlisted for any awards/commendations for its nature conservation/ environmental activities in the last 5 years?:**

**Permanent exhibitions:** Three museums (out of 43, 7%) had won or been shortlisted for awards/commendations for nature conservation /environmental activities linked to permanent exhibitions in the last 5 years; all three were university museums with natural heritage collections.

**Special/temporary exhibitions:** Five museums (out of 43, 12%) had won or been shortlisted for awards/commendations for nature conservation/environmental activities linked to special/temporary exhibitions in the last 5 years. These included 4 university museums (3 with natural heritage collections) and 1 local authority museum (with natural heritage collections).

**Activities for schools:** Three museums (out of 43, 7%) had won or been shortlisted for awards/commendations for nature conservation /environmental activities linked to activities or schools in the last 5 years; all 3 were university museums, 2 of them with natural heritage collections.

**Activities for adults:** Four museums (out of 43, 9%) won or been shortlisted for awards/commendations for nature conservation /environmental activities linked to activities for adults in the last 5 years. These included 3 university museums (2 with natural heritage collections) and 1 local authority museum (with natural heritage collections).

**Activities for HE/FE students:** Three museums (out of 43, 7%) had won or been shortlisted for awards/commendations for nature conservation /environmental activities linked to activities or schools in the last 5 years; all 3 were university museums, 2 of them with natural heritage collections.

**Research-based activities:** Four museums (out of 43, 9%) won or been shortlisted for awards/commendations for nature conservation /environmental activities linked to activities for adults in the last 5 years. These included 3 university museums (2 with natural heritage collections) and 1 local authority museum (with natural heritage collections).

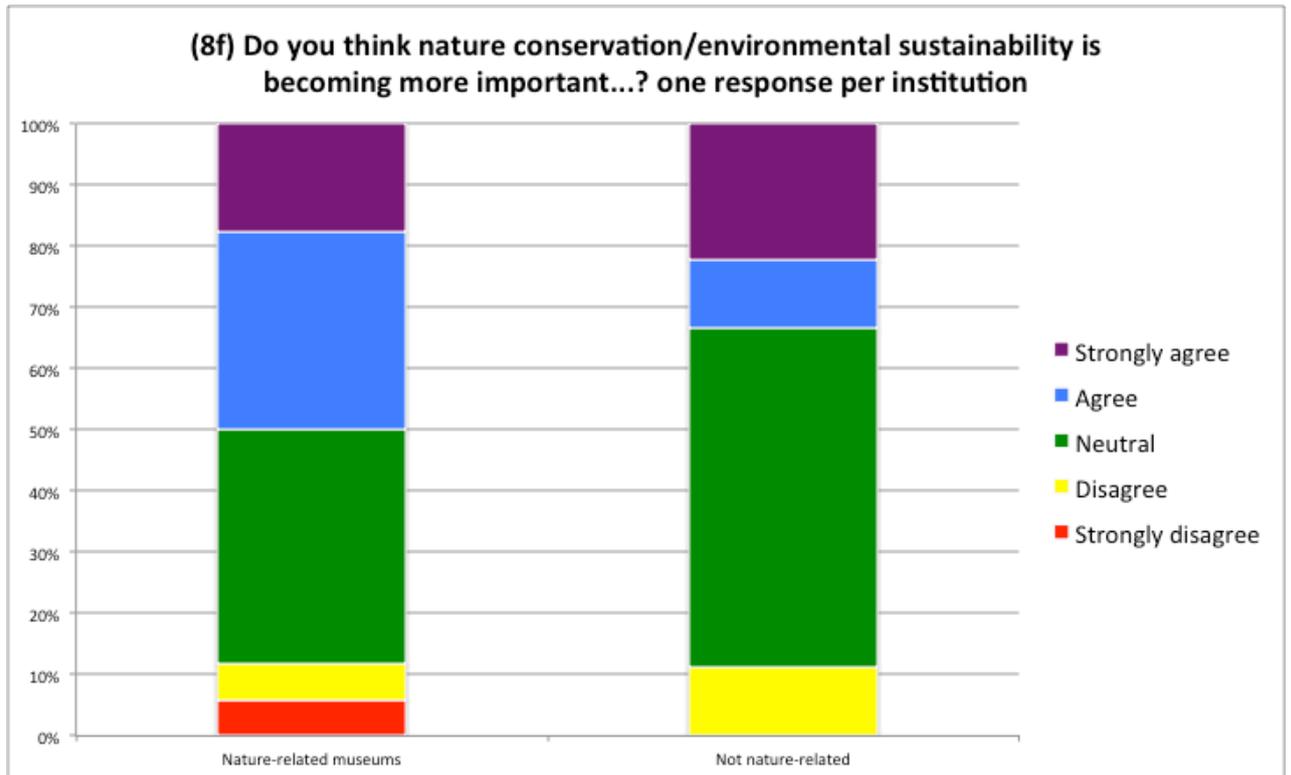
**Operations:** A higher number of museums – 8 (19% of respondents) – had won or been shortlisted for awards/commendations for nature conservation/environmental activities linked to their operations. These included 3 nationals (2 with natural heritage collections), 3 university museums (2 with natural heritage collections) and 2 trusts/independents (1 with natural heritage collections).

It is worth noting that there was a very high degree of overlap between categories, so the same small number of museums had won awards in a number of categories.

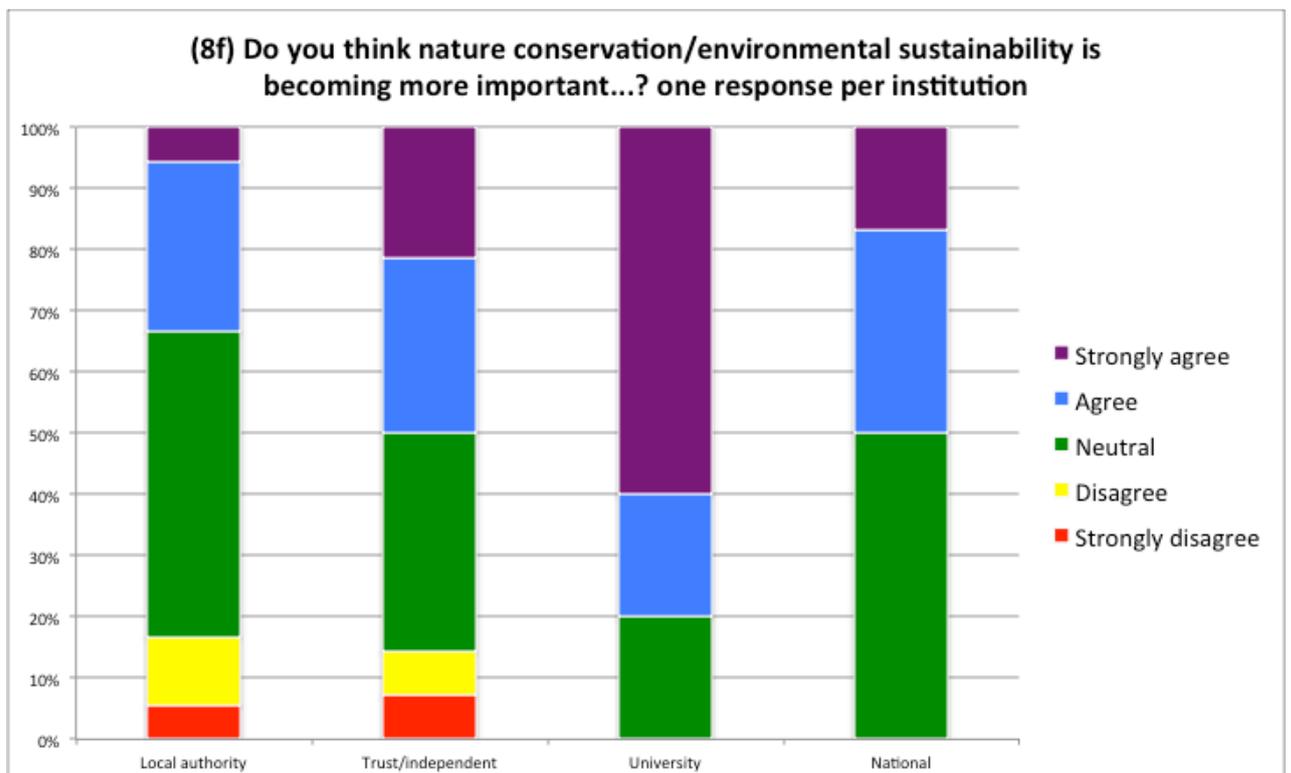
**(8f) Do you think nature conservation/environmental sustainability is becoming more important for your organisation, both in terms of programming and operations?**

	No. of responses	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
Nature-related museums	63	5	4	20	17	17	3.59 (1.19)
Not nature-related	13	0	1	5	2	5	3.84 (1.07)
Local authority	24	2	3	13	5	1	2.95 (0.91)
Trust/Independent	16	1	1	5	4	5	3.71 (1.16)
University	25			3	7	15	4.48 (0.71)
National	11	2	1	4	3	1	3.0 (1.27)

	No. of institutions	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean score (SD)
Nature-related museums	34	2	2	13	11	6	3.50 (1.05)
Not nature-related	9		1	5	1	2	3.44 (1.01)
Local authority	18	1	2	9	5	1	3.17 (0.92)
Trust/Independent	14	1	1	5	4	3	3.50 (1.16)
University	5			1	1	3	4.40 (0.89)
National	6			3	2	1	3.67 (0.82)



There was no strong difference between nature and non-nature related museums in terms of nature conservation/environmental sustainability becoming more important (but see question 1d).



There was a strong difference between university museums and other museum types, in terms of nature conservation/environmental sustainability becoming more important.

**(8g) Is there anything that you feel you need to connect your work with nature conservation/environmental sustainability (e.g. forms of training, confidence building, networks), and what form would you want to get this support? (please try not to answer 'time and money')**

1) Glossary of providers for facts on current issues, to ensure that trustworthy correct sources for facts are used in exhibition content (web based).

-Learning from the experiences of others on holding museum exhibitions on sustainability. (website of examples?)

-Forum / meeting on how geological & nat.sci. collections can be used to talk about current environmental problems.

-Sharing experience on working with artists/multidisciplinary exhibitions.

-Sharing research on how to engage with school pupils on these issues without causing them stress.

-How can museums share data with local biodiversity recorders to provide baseline environmental data for a region?

2) Better recognition of the significance of the work of natural history curators outside, but more particularly within, the museums sector.

3) When I was [Head of Department] we had a very strong focus on nature conservation and climate change. This was maintained by close contacts with agencies such as the former [statutory nature conservation authorities] but also as a member of the national Biodiversity Partnership. This connected us with the relevant agencies but also RSPB, Wildlife Trusts, Universities, National Trust etc etc. Maintenance and development of such links are extremely valuable especially in persuading senior management that our collections play a key role in nature conservation. I fear that such connections are being lost in museums just as the relevance of natural history collections seems to be a very low priority for current UK museum strategies. It is vital that the data and the specimens are recognised as being key elements of biodiversity strategies. These collections are often all that remains of habitats and are important in assessing the past. Furthermore the taxonomic expertise in museums is necessary to support the survey work done by others, many of whom are now no longer sufficient in identifying specimens.

4) I would also be interested in the outcome of the research presented at a future SMILE (Science in Museums Inspiring Learning & Engagement) CPD day... I co-ordinate training days linked to science and learning for educators and collections staff at least once a year. I think a greater level of awareness among our senior management and executive teams would help to ensure that nature conservation is given a higher priority in our museums. Powerful advocacy is the key to making this successful.

5) Greater recognition of the need for specialist curators.

6) I feel under-confident in current best practice in global nature conservation thinking - with a heavy workload it is difficult to keep up to date or know where best to access to new thinking and you don't want to be clunky in your approach. Conferences or workshops bringing in external expertise targeted at museum professionals such as Manchester have provided are of real benefit. In terms of museum work I lack confidence / experience in fieldwork and specimen

preparation. Opportunities to engage with fresh thinking from within and outside the museum sector are always welcomed, especially where backed up with evidence. Even some of the questions here make me think do we have enough evidence that this approach works.... and will stimulate a refocus on this and thinking about wider opportunities.

7) Need to bring more specialist knowledge on to a gallery development committee to help steer the gallery team. This could be from academics, conservationists, sustainability champions being on a panel of advisors.

8) Specific training and development opportunities.

9) Commitment from the trust's leadership to promoting the natural sciences collection within museum displays and projects.

10) More information and opportunities to connect with nature conservation and other organisations to help showcase their work and develop ours.

11) Yes, I would like peer support and someone to offer and share their knowledge in an environment that makes you feel at ease, not one that makes you feel as if you should be doing this stuff anyway. I would like to be able to admit the things that I am unsure of freely without being judged. (This is in no way reference to my organisation, but in reference to external workshops). I feel that those in the know stay in the know and those that don't know never really get practical support that they can actually take away and use to make a difference, because issues can often be case by case and not general (apart from time and money). This kind of support would probably be more one to one rather than group lead and I feel that it would also need supporting/leading from the top down, rather than the bottom up.

12) An individual (in this case curator) can only do so much. To be thoroughly effective it takes the mind-set of an entire organisation to move in a particular direction. More work on directors and the sector as a whole is needed if organisations are going to embed nature conservation in their everyday practice.

13) Training on how to build partnerships with external conservation organisations would be very useful.

14) Support for non-specialist curators.

15) Greater connection with regional, national, international networks. Perhaps specific research on connections with the gallery collections, exhibitions and events programme e.g. artists whose work might inspire connections. Probably need a joined-up approach across the gallery team to develop ideas and approaches. I am very uncertain on some of the answers to the above questions, as we are so artist/collection led with a very eclectic programme, rather than being a museum which already has an obvious collection/programme based link with nature conservation/sustainability.

16) Share the results of the various initiatives: if recycling paper, how much was collected in the year? If reducing water usage, by how much? That will motivate people more than simply inviting them to recycle, use resources more sustainably, in my opinion.

17) Living a sustainable lifestyle...and understanding it and being content with it

18) [The museum I work in] has the capability and means to be a wonderful nature base for the local community to stand up and shout about conservation and environmental sustainability but

higher staff have their own interests and it is NOT nature. Even though the museum has nationally important collections they have no expertise and have no interest (unless they bring funding) in using experts to highlight these collections.

19) In the grand scheme of things it is not a priority in our museum as there are other depts. of the council doing bigger projects in this respect eg canal regeneration, parks dept etc.

20) Training volunteers and staff about ways that the Museum can be more sustainable and impact on Green Issues.

21) Training on use of natural history collections would be helpful. Also a touring event/interactive offer for conservation that visited different museums but fun and good for families i.e. like Madlab in Manchester does for digital

22) More specialist staff (not quite the same as time and money, but effectively amounting to the same thing).

23) Building genuine connection to nature and encouraging participation in conservation activities are key missions for [our organisation]. We are striving to deepen understanding of nature connection and to build networks to support this.

24) This is complex - think that collaborative discussion would be a good start in the sector.

25) More networking and partnership working with Nature Conservation/Environmental Sustainability promoting organisations, training opportunities with examples of best practice in how environmental concerns can be promoted to our audience through the use of our collections

26) Links with relevant organisations (local up to international), interpretation training - how to link exhibits or create events with conservation slant.

27) Redisplay and reinterpretation of specimens to bring their independent interpretation by visitors into the 21st century and reflect topics around conservation and sustainability that directly link them to the displays.

28) Training, increased communication of activities and impacts from colleagues.

29) Confidence building networks to take away the thought that the collection might get damaged or compromised but to become more proactive in reaching out engaging with conservation organisations and scientists who see the potential in our collection e.g. recommendations for a research centre and or a facility to be a centre of excellence for conservation research thereby contributing to modern conservation.

30) We do the best we can with limited resources to open our the eyes and minds of our visitors [c 90% tourists visiting the [local national park] to the natural wealth of this special place and the need to protect this fragile environment for all life forms for ever, for everyone, native, resident, transient or tourist.

31) As a non-specialist curator in a small museum with diverse collections, expert help in how to use our collections more effectively for nature conservation and environmental sustainability would be great. We build good ideas, we see them put into action, they work well and then we also lack the specialist knowledge in terms of potential funding sources to make these impacts sustainable!

32) Networking within the visual arts sector.

- 33) Could still do more in the park [surrounding the gallery]- such as provide hides and social spaces whatever the weather. Grow plants for dyeing fabrics, grow food for the cafe etc
- 34) I think training and networking opportunities are important for the future, as we've tended to rely on knowledge & connections that people bring with them.
- 35) Training, confidence building and networks all useful!
- 36) Possibly a workshop to give some more ideas above and beyond the kinds of events we plan already.
- 37) Changes in the way museums are organised and run. Need a move away from the current trend of seeing museums as "entertainment" venues fighting for footfall, and revenue, with other tourist venues. There also needs to be a governmental change which recognises the contribution museums make to science and technological developments.
- 38) Networking and training in some of the most pertinent issues. We do not have trained biologists on staff. Some time with a specialist to use our collections to demonstrate some of these.

## **How do UK museums and galleries support nature?**

Henry McGhie, Head of Collections and Curator of Zoology, Manchester Museum,  
henry.mcghie@manchester.ac.uk.

Museums and galleries can play an important role in supporting nature and nature conservation, whether through their exhibitions and events, their collections, research programmes, how they run their buildings or events, transport collections as part of loans, or manage their grounds. Supporting and nature and nature conservation is not restricted to natural history museums. How does your museum/ gallery/ cultural venue support nature or nature conservation? Take part in this short questionnaire to find out, and to contribute to a national study. The questionnaire takes about 5-10 minutes (honestly).

This study is intended to evaluate the nature conservation mission and actions of UK museums and galleries, through the perceptions of those who work in them. It is not restricted to museums whose collections solely or largely consist of preserved natural heritage (natural history/natural science), and responses are sought from a wide range of museums, recognising that museums may be part of a broader service, and that museums, galleries and similar institutions have great potential to connect with a nature conservation mission.

### Nature conservation not object conservation

For the purposes of this study, 'conservation' does not mean the care or preparation of objects, but care, management, preservation, research and education/engagement relating to natural heritage (living, environmental and geological) beyond the museum. Nature conservation is 'a value-driven discipline based on the premise that the preservation of species diversity, ecological systems, and evolutionary processes in nature is important to the maintenance of life on our planet. Conservationists seek ways to protect natural systems and heal the wounds of degraded systems. Conservation actions are ultimately unsuccessful if the amount of wild lands and wildlife continues to decline' (see Miller *et al.* for references).

### Data use and protection

Responses are sought to explore museum workers' individual perceptions of the ways museums, and their museums in particular, connect with a nature conservation mission. Where relevant, responses should relate to an overall museum, not a single department, and it is perfectly fine for more than one person per museum/gallery to answer, as this is about exploring individual perceptions. There are no right or wrong answers in this study. Data will be grouped for analysis. Responses will be non-attributable to individuals in the final write-up. Museums will be grouped by museum type, with groupings determined by response rates, geography and governance type (e.g. national, regional, university, local authority). Analyses will also be based on differences in role type. By responding, participants agree that their answers can be included in analysis. Data will be kept for the purpose of this and similar projects only, and will not be shared with a third party.

(1a) Do you think that the museum/gallery sector as a whole incorporates nature conservation into policy decisions relating to the entire sector?

(1b) Do you think that the museum/gallery sector as a whole should incorporate nature conservation into policy decisions relating to the entire sector?

(1c) Do you think that major museum/gallery funders (e.g. HLF, Arts Council England, Museums Galleries Scotland, DCMS, HEFCE) incorporate nature conservation into policy decisions relating to the museum/gallery sector?

(1d) Does your museum/gallery incorporate nature conservation (either through direct impacts on nature or in terms of its collections and engagement) into its overarching mission and strategies?

(1e) If your museum is part of a service or larger organisation, does your parent organisation incorporate nature conservation into its overarching mission and strategies?

(1f) Is nature conservation (environmental sustainability, wildlife conservation, climate change action) championed by your museum's director and/or senior team?

(1g) Does your museum/gallery have named responsibility in local/national/international nature conservation strategy/policy/action plans?:

- Nature conservation strategy/action plans
- Green & Blue Infrastructure strategy
- Climate change strategy/action
- Nature and wellbeing strategy/action

(1h) How important do you think it is that your museum/gallery connects with species conservation, in its operations and programming?

(1i) How important do you think it is that your museum/gallery connects with climate change action, in its operations and programming?

(1j) How important do you think it is that your museum/gallery connects with protecting endangered habitats, in its operations and programming?

(1k) How important do you think it is that your museum/gallery models good behaviour in terms of nature conservation and environmental sustainability?

(2a) Does your organisation commit funding internally towards activities that can support nature conservation/environmental sustainability in some way?:

- Staffing
- Exhibitions
- Events]
- Activities for schools
- Outreach/community engagement

(2b) Does your organisation fund-raise for activities drawing on its support for nature conservation?

(3a) Does your museum/gallery have collections that could support nature conservation research (conservation of wild places and species)?

(3b) Approximately how many specimens/objects (i.e. how many natural heritage specimens/objects are there)?

(3c) What groups do these belong to?:

vertebrates/invertebrates/plants/fungi/rocks/minerals/fossils

(3d) Does your museum/gallery still collect objects/specimens relating to these groups?

(3e) Does your museum/gallery employ people who are educated/trained/have worked in nature conservation and/or with environmental issues to care for/interpret collections?

(3f) Does your museum/gallery employ people who are educated/trained/have worked in nature conservation and/or with environmental issues to engage with school students?

(3g) Has your museum/gallery specified interest and/or commitment to nature conservation and environmental sustainability in job advertisements (not necessarily in all job adverts)?

(3h) Has your museum/gallery recruited volunteers specifying an interest in nature conservation and/or environmental sustainability?

(3i) Does your museum/gallery employ staff to enable research by others on collections in support of nature conservation and/or environmental sustainability?

(3j) Does your museum/gallery support staff time to prepare collections, and make collections-information available, in support of nature conservation and/or environmental sustainability?

(3k) Does your museum/gallery support staff time to participate in nature conservation and/or environmental sustainability-related activities outside the museum?:

- Field work and surveys
- Field collecting
- Habitat restoration
- Habitat creation

(3l) Does your museum/gallery support university or college education on nature conservation and/or environmental sustainability related activities?

(3m) Do staff deliver higher/further education student teaching on nature conservation and/or environmental sustainability related activities?

(3n) In the last five years, has your museum/gallery supported traineeships, internships or placements that incorporated nature conservation and/or environmental sustainability related activities?

(3o) Has your museum/gallery and its collections contributed directly to research publications relating to nature conservation and/or environmental sustainability (whether authored by museum staff or external researchers)?

(3p) Approximately how many publications a year relate to nature conservation/environmental sustainability in some way (for your entire museum/gallery)

(3q) In the last 5 years, has your museum/gallery supported/enabled nature conservation and/or environmental sustainability projects by external partners (e.g. Wildlife Trusts, RSPB)?:

- Access to specimens/objects/collections
- Contributed towards exhibitions
- Took part in events in the museum/gallery

(4a) Does your organisation raise awareness of issues relating to nature conservation/environmental sustainability at a policy/strategic level (i.e. in the city/region/nationally/internationally?)

(4b) Does your organisation provide a public platform for organisations working with local/regional/national/international policy or strategy relating to nature conservation/environmental sustainability?

(4c) Would you say that staff are, in general, committed to nature conservation and/or environmental sustainability?

(5a) Does your museum/gallery hold public events in support of nature conservation and/or environmental sustainability, or promoting people's connection with nature, for non-specialist adults? Please give some examples

(5b) Does your museum/gallery hold public events in support of nature conservation and/or environmental sustainability, or promoting people's connection with nature, for specialist adults? Please give some examples

(5c) Does your museum/gallery hold public events in support of nature conservation and/or environmental sustainability, or promoting people's connection with nature, specifically for people over 60? Please give some examples

(5d) Does your museum/gallery hold public events in support of nature conservation and/or environmental sustainability, or promoting people's connection with nature, for families/children? Please give some examples

(5e) Does your museum/gallery hold events in support of nature conservation and/or environmental sustainability, or promoting people's connection with nature, for schools? Please give some examples

(5f) In the last five years, has your museum/gallery been involved in citizen science projects in support of nature conservation and/or environmental sustainability? Please give some examples

(5g) In terms of your museum/gallery's engagement around nature and environmental sustainability (in exhibitions and programmes), would you say your museum/gallery's focus was to:

- Lets the public know about nature conservation/environmental issues
- Communicates the severity of environmental challenges
- Communicates nature conservation successes and opportunities
- Sign-posts the public towards nature conservation activities to take part in
- Encourages the public to think creatively about dealing with environmental challenges
- Connects visitors' choices and actions with impacts (local and global)
- Gives the public opportunities to respond/share their ideas/opinions

(5h) Which of these approaches do you think are most successful in promoting public action around nature conservation/environmental sustainability?:

- Let the public know about nature conservation/environmental issues
- Communicate the severity of environmental challenges

- Communicate nature conservation successes and opportunities
- Sign-post the public towards nature conservation activities to take part in
- Encourage the public to think creatively about dealing with environmental challenges
- Connect visitors' choices and actions with impacts (local and global)
- Give the public opportunities to respond/share their ideas/opinions

(6a) Does your museum/gallery contribute directly to habitat/species conservation and/or environmental sustainability worldwide, for example by providing funding and/or supporting particular species protection programmes? Please give some examples

(6b) Does your museum/gallery work in partnership with nature conservation projects directed towards habitat creation/protection locally? Please give some examples

(6c) Does your museum provide habitat/support for non-human species, e.g. in parks, grounds, allotments, bee-hives?

(7a) Does your museum/gallery contain permanent galleries featuring nature conservation (either as an underlying theme, or a section within a gallery) (these don't need to have been developed within the last five years)? Please give some examples

(7b) Is support for nature conservation/environmental sustainability considered to be a key intended outcome of your permanent galleries (some or all)?

(7c) Approximately how many of your special/temporary exhibitions feature/reference nature in some way?

(7d) Is support (not necessarily financial support) for nature conservation considered to be a key intended outcome of your special/temporary exhibitions that relate to nature/nature conservation?

(8a) Over the last 5 years, Has your museum/gallery taken proactive steps to reduce its:

- Water use
- Electricity use
- Impacts through travel
- Paper use
- Food waste
- Environmental impacts due to food (meat, dairy)
- Impact on habitats (e.g. use of peat in compost)
- Impact on species (e.g. use of tropical hardwoods)

(8b) Does your museum/gallery aim to be a role model in terms of supporting nature conservation and/or environmental sustainability?:

(8c) Does your museum/gallery aim to be a leader in terms of supporting nature conservation and/or environmental sustainability?:

(8d) Has your museum won or been shortlisted for any awards/commendations for its nature conservation/ environmental activities in the last 5 years?:

- Permanent exhibitions
- Special/temporary exhibitions

- Activities for schools
- Activities for families
- Activities for adults
- Activities for HE/FE students
- Research-based activities
- Operations

(8e) Please give some examples

(8f) Do you think nature conservation/environmental sustainability is becoming more important for your organisation, both in terms of programming and operations?

(8g) Is there anything that you feel you need to connect your work with nature conservation/environmental sustainability (e.g. forms of training, confidence building, networks), and what form would you want to get this support? (please try not to answer 'time and money')