

Engaging museum visitors with the biodiversity crisis through a natural history collection

Case study of the Suriname exhibition at Naturalis Biodiversity Center



Jaguar • Tigri

I contribute to the forest's conservation.
I stand for courage. I see you before you see me.

*'Keep on hiding, jaguar, remain a forest spirit.
Without you, the rainforest has no chance of survival.'* Humberto Tan

Photo:

Jaguar from Naturalis' natural history collection
featured in the Suriname exhibition, with its label text
(Panthera onca, RMNH.MAM.60132, photo: Naturalis)

Background image:

Biodiversity Stripes

visualising that global biodiversity has declined 73% between 1970 and 2020
(Biodiversitystripes.info and Living Planet Index database 2024)

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Objective

This study aims to provide insights that will assist Naturalis in enhancing public understanding of biodiversity and encouraging greater stewardship of nature in its exhibitions.

Problem

This research observes and addresses three challenges for Naturalis:

- Absence of a complete account of the true impact of humans on biodiversity in its exhibitions.
- Unmet visitors' expectations to learn about the biodiversity crisis.
- A discrepancy between Naturalis' strategic ambition to inform people about the importance of nature and biodiversity and what the biodiversity crisis means, and its exhibitions, which primarily celebrate nature's beauty while neglecting its degradation.

Approach

This applied research explores how the ecological crisis is currently communicated and how museums aim to inspire visitors to help mitigate the effects of unsustainable human pressures on the natural environment.

It investigates Naturalis' current practices through a comprehensive analysis of its nine permanent exhibitions, six semi-structured interviews with staff, and a study of the development process of its forthcoming Suriname exhibition. It compares these practices with its ambitions outlined in its Strategic Plan 2025-2028, and with the current museum landscape, which is examined through

exhibition analyses in natural history exhibitions in nine museums, both in the Netherlands and abroad.

The literature study delves into topics such as public awareness of planetary crises, the theory-action gap, the human-nature divide, museum learning, and the role and responsibility of museums and collections amidst societal change.

The interpretation of the results from these various approaches leads to recommendations for Naturalis as an organisation and its future exhibitions, and suggests concrete interventions for current exhibitions.

Analysed natural history exhibitions

- Allard Pierson, Amsterdam (*Call of the O'o*)
- Artis-Groote Museum, Amsterdam (entire museum)
- Chhatrapati Shivaji Maharaj Vastu Sangrahalaya (CSMVS), Mumbai (*Indigenous Biodiversity Garden and Birds and Mammals galleries*)
- Mission Museum, Steyl (permanent exhibition and *Birds of God*)
- Musée des Confluences, Lyon (*Species, the Web of Life*)
- Museon-Omniversum, The Hague (*One Planet Expo*)
- Natural History Museum, London (*Fixing Our Broken Planet*)
- Natural Sciences, Brussels (*Gallery of Evolution and Living Planet*)
- Natuurmuseum Brabant, Tilburg (*Long Live Life*)

Conclusion

In the Suriname exhibition, multivocality (i.e., the inclusion of non-Western worldviews alongside the scientific perspective) takes priority over ecological urgency. To achieve its ambitions of becoming a change agent in a biodiversity-positive society, Naturalis will need to strengthen its messaging in its upcoming exhibition about biodiversity and through interventions in its permanent exhibitions.

See other side for complete conclusions and recommendations.

'I hope that by touching visitors' hearts in an exhibition, it will inspire them to see the intrinsic value of nature.

However, I don't like pointing fingers.

Visitors come for a day out; they don't want to feel like they are in a classroom.'

Marijke Besselink, scientific content developer at Naturalis, in an interview conducted for this research, 2025¹

'Why should shouting louder about the climate and ecological crisis be a problem?

The science is overwhelmingly clear, and it affects literally everyone: museums, their staff, their visitors.

Given such an existential threat, as institutions of the long term, able to place what's going on into a wider context, it is an ethical imperative for museums to shout louder and take action.'

Nick Merriman in *Museums and the Climate Crisis*, 2024²

Who: Naturalis Biodiversity Center

Naturalis is a leading institution in biodiversity research, attracting around 500,000 museum visitors annually. Its family-oriented exhibitions focus on the beauty and diversity of nature.

What: Informing or activating?

To engage means 'to interest someone in something and keep them thinking about it,'³ encompassing the spectrum from informing to activating. This study focuses on what museums provide, rather than on post-visit behavioural change.

How: Natural history collection

Over a billion dead animals, plants, and other species are stored in depots of more than 1,000 museums worldwide,⁷ accessible only to scientists seeking to understand life. Collections are the natural history museum's *raison d'être*. As tangible assets in a digital age, (some) specimens can also educate the public about life. Natural history collections can gain significance for the public in the essential narrative of human impact on biodiversity.

Research Question

How does Naturalis engage its museum visitors with the human impact on biodiversity through a natural history collection in its developing exhibition about Suriname?

Where: Suriname exhibition

The *Forest of Suriname* is Naturalis' first exhibition in which its new strategic ambition to engage the public with the biodiversity crisis may take shape. It is a temporary, immersive exhibition opening in October 2025. The exhibition amplifies the voices of the forest's inhabitants: the Maroons and Indigenous peoples of Suriname, along with the forest itself, a living, breathing organism in which everything is interconnected.

Why: Biodiversity crisis

Despite 75 years of international efforts to protect the natural environment, in the past 50 years, wildlife populations have declined by 73%⁴ and 1 million species face extinction.⁵

The public has not been motivated to meaningful action, while it is believed that individuals and communities hold the key to biodiversity regeneration. Although 71% in Europe have heard of biodiversity, only 41% understand what it means.⁶

There is an urgent need to inform the public about the significance of biodiversity and encourage them to protect it. As trusted public institutions that represent long-term societal meaning-making, museums can play a vital role in this effort.

Conclusions

The research findings are organised around ten sub-questions, grouped into three themes. Based on the topics identified in the literature review, the discussion chapter reflects on these results. It compares how Naturalis as an institution, the Suriname exhibition, and the other studied museums address these issues. The following text presents the conclusions related to the ten research sub-questions.

MAIN RESEARCH QUESTION:

How does Naturalis engage its museum visitors with the human impact on biodiversity through a natural history collection in its developing exhibition about Suriname?

Naturalis utilises its natural history collection in the upcoming Suriname exhibition to illustrate the relationship between forest inhabitants and their environment, serving as inspiration to revere and care for nature. While it mentions the anthropogenic pressures on the forest, it does not explicitly motivate visitors to act in the urgency of the biodiversity crisis, which does not align with Naturalis’ ambitions to become a change agent in a biodiversity-positive society.

THE MUSEUM LANDSCAPE:

Why do visitors need to be engaged with the human impact on biodiversity?

A surprisingly large number of people in Europe and the Netherlands are unaware of the vital role biodiversity plays in the survival of many species, including humans⁸. The environmental crisis is connected to social injustices and stems from a disrupted relationship between individuals, primarily in the Global North, and the natural world⁹.

What is the responsibility of museums concerning the biodiversity crisis?

Museums have an ethical responsibility to raise awareness of the ecological crisis and encourage their visitors to take action, yet they are hesitant to take a stance, fearing bias, political influence, or the erosion of their perceived neutrality^{10, 11, 12}.

How can visitors be engaged with environmental issues?

Although not exhaustive, this study found several ways in which literature suggests museums can play a role in bridging the intention-behaviour gap and activate visitors in environmental issues, including educating people about misconceptions about their potential impact¹³, stimulating dialogue regarding norms and values¹⁴, enhancing visitors’ relationship with nature¹⁵, offering a beckoning perspective^{16, 17}, setting good examples to stimulate conditional cooperation¹⁸, and providing concrete, sustainable actions¹⁹.

How do other museums engage their visitors with the human impact on biodiversity?

Seventeen years after Michael Novacek’s plea for increased efforts by museums to engage their visitors in biodiversity issues²⁰, based on comprehensive analyses of eleven exhibitions, this study demonstrates that most museums raise awareness about the state of the natural world. Although further research, including the analysis of more museums, would provide stronger evidence, this study suggests that museums are making progress in this area. Some exhibitions thoroughly explain the concept of biodiversity and its importance, while others highlight the culture-nature divide as a contributing factor to the planetary crises.

NATURALIS’ INSTITUTIONAL CONTEXT:

How does Naturalis engage its museum visitors with the human impact on biodiversity in its current nine permanent exhibitions?

Naturalis, with its nine current exhibitions, primarily celebrates nature’s beauty while overlooking its degradation, with a few exceptions in the exhibition *Death*. Moreover, Naturalis does not explicitly explain what biodiversity is or why it is important, and scarcely illustrates the link between biodiversity and climate change or pollution.

What role can the collection play in Naturalis’ narrative of human impact on biodiversity?

The interviewed staff see different opportunities to use the collection to tell the story of the biodiversity crisis, such as using specimens to illustrate this narrative or using the collection as a driver of storytelling.

What are Naturalis’ ambitions regarding public engagement with the biodiversity crisis?

Naturalis aims to enhance its public engagement regarding the biodiversity crisis and to become a change agent for this topic²¹. It has initiated the development of a dedicated exhibition to inspire people to commit themselves to a biodiversity-positive society, set to open in 2026-2027, and it aims to implement some interventions in its current museum to boost visitor awareness of the biodiversity crisis, for example, in *LiveScience*.

THE SURINAME EXHIBITION:

How will the Suriname exhibition address the human impact on biodiversity?

The Forest of Suriname is a forthcoming temporary exhibition about ensouled nature. Although Naturalis’ Strategic Plan 2025-2028 was developed during the creation of the exhibition brief, Naturalis’ new ambition to address the biodiversity crisis in its exhibitions was not included in the assignment for the Suriname exhibition²². However, this research reveals that the Suriname exhibition will nonetheless raise awareness of the human impact on biodiversity, albeit mostly in a poetic way. With a focus on the relationship of Maroons and Indigenous peoples with the forest, the exhibition will highlight worldviews beyond the scientific, allowing for multivocality –a pressing societal issue, which may help bridge the culture-nature gap. The exhibition will deepen visitors’ appreciation of nature through an immersive presentation of the forest, engaging interactives and a kaleidoscope of stories that bring the collection objects to life. Immersive storytelling is a unique and powerful quality of Naturalis. However, for Dutch people, it may be difficult to link the Amazon to their own backyard, while relating environmental issues to people they know could stimulate their willingness to contribute to nature conservation²³. Because Naturalis is concerned about commonplace examples, moralism and visitor discomfort, the exhibition does not activate visitors directly.

What role does the collection play in the narrative of the Suriname exhibition concerning the human impact on biodiversity?

The Dutch colonial history has resulted in a substantial collection of Surinamese specimens, which forms an intrinsic driver of the Suriname exhibition’s narrative. Notable collection objects will be crucial in engaging visitors. However, their contribution to the story of human impact on biodiversity remains limited. The exhibition will feature non-furry species, such as plants and insects, demonstrating that all aspects of nature are important for ecosystems; yet, kingdoms other than plants and animals, as well as many unknown phyla in the animal kingdom, remain unilluminated.

How do Naturalis’ ambitions for public engagement with the biodiversity crisis manifest in the Suriname exhibition?

The implicit messaging might not communicate the importance of protecting ecosystems to every visitor. The exhibition will provide a dedicated space for reflection, with an invitation to consider what the forest means to you. The methodology of this study, which prioritises information over experience and concentrates on natural history collections, limited this study’s ability to recognise the significance of dialogue and experiential learning. Further research could yield a deeper understanding of the value of interaction and visitor experiences concerning the human impact on biodiversity.

In its Strategic Plan 2025-2028, Naturalis has identified its relevance to museum visitors during turbulent times of societal change and now faces the challenge of prioritising this strategic goal throughout the museum department to stimulate public action towards a sustainable future.

Recommendations

Based on this research, many potential recommendations surface. Here, only a few are specified. The page numbers refer to the pages that explain the concepts (and authors) underlying these recommendations, as they are sometimes inspired by literature but do not directly refer to one particular author or paper.

Recommendation for Naturalis, as an organisation

Museums play a vital role as change agents in tackling environmental crises and providing the public with what it needs, not what it wants (see pages 31-33, 78-81). Naturalis has recognised this in its Strategic Plan 2025-2028. Consider who will be the custodian of those new values and ambitions, and appoint a dedicated team or include this responsibility in the job descriptions of current staff.

Recommendations for future exhibitions

- Embracing an interdisciplinary approach to include culture in the broad sense, can help to address the culture-nature divide (see pages 79, 81). The Suriname exhibition is already a good example. For future exhibitions, consider continuing to reach out to the arts and humanities, as well as to Indigenous knowledge.
- In exhibitions that depict nature as pristine, the public’s understanding of the state of nature is undermined (see pages 28, 79). Consider visualising the human impact on nature in future exhibitions. A good example is the viewers at *Ice Age* that illustrate how the landscape has changed due to human activity.
- Consider mining the collections and the knowledge of the institutions’ scientists for collection specimens that tell stories about the human impact on biodiversity. Collection objects can be illustrative but can also contain powerful intrinsic stories (see pages 34-35, 66).
- Consider including environment-positive visitor activities, because ‘actions drive beliefs’ (see pages 38-39, 87).
- Hope is not the only positive emotion. Focusing on shared values and solutions rather than problems can activate people (see pages 36-37, 86).
- Reduce the environmental impact of exhibitions and communicate those sustainable practices to the public, to maximise the effect of conditional cooperation (see pages 36, 85).

References

- Marijke Besselink, *Interview with Marijke Besselink (Scientific Content Developer at Presentations Department Naturalis)*, *Interviewed by Josje-Marie Vrolijk, in Leiden*, 10 April 2025.
- Nick Merriman, ed., *Museums and the Climate Crisis*, 1st ed. (Routledge, 2024), 12, <https://doi.org/10.4324/9781003347606>.
- Cambridge Dictionary, 'Engage', 21 May 2025, <https://dictionary.cambridge.org/dictionary/english/engage>.
- WWF, *Living Planet Report 2024 – A System in Peril* (Gland, Switzerland., 2024), 7.
- IPBES, *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (2019), <https://doi.org/10.5281/ZENODO.3831673>.
- European Commission, Directorate General for Environment, *Attitudes of Europeans towards Biodiversity*, 481, Special Eurobarometer (Brussels, 2019), 7, <https://europa.eu/eurobarometer/surveys/detail/2194>.
- Kirk R. Johnson et al., 'A Global Approach for Natural History Museum Collections', *Science* Vol 379, Issue 6638 (March 2023): 1193.
- European Commission, Directorate General for Environment, *Attitudes of Europeans towards Biodiversity*, 7.
- Philippe Descola, *Beyond Nature and Culture*, trans. Janet Lloyd (The University of Chicago Press, 2013) Original publication 2005.
- Robert R. James, *Museums in a Troubled World: Renewal, Irrelevance or Collapse?*, Museum Meanings (Routledge, 2009), 146.
- Nick Merriman, ed., *Museums and the Climate Crisis*, 1st ed. (Routledge, 2024), 12.
- Sarah Sutton, 'The Evolving Responsibility of Museum Work in the Time of Climate Change', *Museum Management and Curatorship* 35, no. 6 (2020): 624, <https://doi.org/10.1080/09647775.2020.1837000>.
- Alyssa H. Sinclair et al., 'Behavioral Interventions Motivate Action to Address Climate Change', *Proceedings of the National Academy of Sciences* 122, no. 20 (2025): 2, <https://doi.org/10.1073/pnas.2426768122>.
- Maroesjka Versantvoort et al., 'Between Sustainable Thinking and Sustainable Doing. Attitude, Behaviour and Willingness to Change among Religious and Non-Religious Dutch Citizens in Relation to Climate Change. Summary', Sociaal Cultureel Planbureau & Protestantse Theologische Universiteit, April 2024, 5, 10.
- Nicole V. DeVille et al., 'Time Spent in Nature Is Associated with Increased Pro-Environmental Attitudes and Behaviors', *International Journal of Environmental Research and Public Health* 18, no. 14 (2021): 13, <https://doi.org/10.3390/ijerph18147498>.
- Emiel De Lange et al., 'Communicating the Biodiversity Crisis: From "Warnings" to Positive Engagement', *Tropical Conservation Science* 15 (July 2022): 2, <https://doi.org/10.1177/19400829221134893>.
- Anat Shenker-Osorio, 'Messaging This Moment: A Handbook for Progressive Communicators', Center for Community Change, 2017, 10–11, www.communitychange.org/wp-content/uploads/C3-Messaging-This-Moment-Handbook.pdf.
- Leonardo Becchetti et al., 'What about the Others? Conditional Cooperation, Climate Change Perception and Ecological Actions', *Ecological Economics* 227 (January 2025): 10, <https://doi.org/10.1016/j.ecolecon.2024.108371>.
- TED Talk: *Feeling Stuck on Climate Change? Here's What to Do*, directed by Kris De Meyer, 2024, https://www.ted.com/talks/kris_de_meyer_feeling_stuck_on_climate_change_here_s_what_to_do.
- Michael J. Novacek, 'Engaging the Public in Biodiversity Issues', *Proceedings of the National Academy of Sciences* 105, no. supplement_1 (2008): 11571–78, <https://doi.org/10.1073/pnas.0802599105>.
- Naturalis Biodiversity Center, *Strategic Plan 2025-2028* (2024), 16.
- Marjolein Van Breemen, 'Opdracht Suriname Tentoonstelling [Exhibition Brief Suriname Exhibition]', Naturalis Biodiversity Center, 8 February 2024.
- Sinclair et al., 'Behavioral Interventions Motivate Action to Address Climate Change', 9.

- Consider stimulating discussion and interpretation in exhibitions (see pages 36, 39, 66, 84). With thought-provoking questions and room for reflection, peer interaction can be stimulated. This is already offered in the Suriname exhibition but can be done even more provocatively.

Suggestions for concrete interventions in current exhibitions

- Exhibition *Life* only features animals, the majority of which are vertebrates (excluding humans) and a few molluscs. This highlights the human-nature divide and fails to recognise the value of all life in ecosystems (see pages 35, 64, 83). Consider including specimens of other kingdoms, such as plants, fungi, or smaller species, or consider changing the name to *Animalia*.
- Consider including the human impact on biodiversity in *Life* (see page 28). For example, include fragments of human activity in the video screens that now show pristine habitats, or place little stickers on the labels showing the animal’s status.
- Consider changing a few labels to convey the urgency and severity of the biodiversity crisis, for example, the dodo label in *Death* (see page 62). Several species per hour are driven to extinction, so instead of ‘This bird died out when humans interfered with its environment. Which animal is next on the list?’ the label could say: ‘This bird died out when humans interfered with its environment. How can the current speed at which species are going extinct because of human behaviour be slowed down?’
- Consider changing a few labels in *Ice Age*, to mention the fact that some of the displayed animals are now extinct due to human activity (see page 64).
- The Allard Pierson featured information about the species identification project ARISE in its exhibition, inviting museum visitors to contribute to collecting data. *LiveScience* already offers ‘behind the scenes’ information about science. Consider extending this by showcasing the significant biodiversity identification and protection projects and achievements, such as ARISE, eDentity, and the *Status Report on Dutch Biodiversity*, more prominently in the museum.