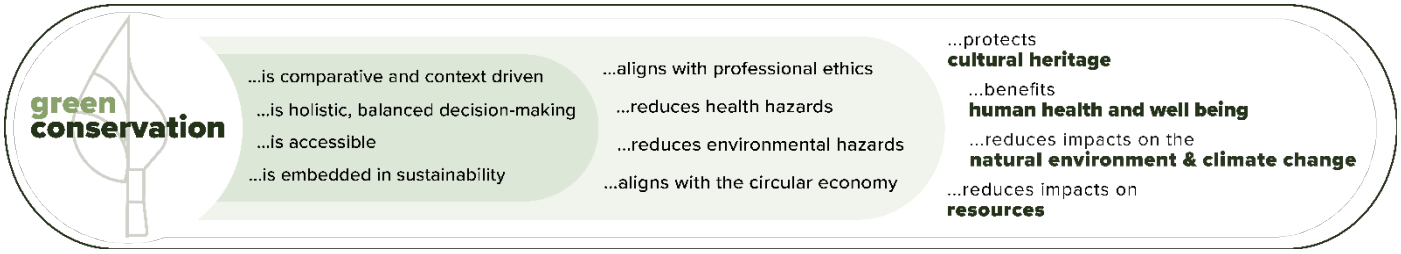
THE GREEN CONSERVATION DEFINITION

Green conservation is a sustainable approach that involves holistic, balanced decision-making to reduce health, climate and environmental hazards while adhering to professional ethics.

Green conservation aspires to protect cultural heritage while minimizing harmful impacts on climate, human health, environment and resources.



HOLISTIC DEFINITION FOR CULTURAL HERITAGE CONSERVATION

Conservation has a uniquely positive and powerful role to play in shaping a sustainable future: it preserves cultural heritage for current and future generations and supports economic and societal stability. Climate change and its destructive impacts endangers cultural heritage. So a vital part of cultural heritage conservation is assessing and adapting professional practices to help combat these foremost agents of change. Embedded within this sustainability context green conservation prioritizes the environment, and human health and wellbeing, through holistic decision-making. Aligned with conservation ethics and values it allows for future developments and considers the entirety of consequences within investigative, interventive and preventive practice. It involves a considered balancing of the impacts, before, during and after any decision or approach. Cultural heritage professionals should actively adopt a green conservation approach, with institutional support in accordance with the Economic, Social and Environmental pillars of sustainability.

GREEN CONSERVATION

Green conservation is an aspirational, consultative process and always comparative in practice. A green conservation approach is minimally harmful to the environment and humans. Aligning with the circular economy, green conservation is decarbonizing, zero-waste, accessible, and available. We strive for green conservation through decision-making and evolving practice, which takes all these aspects into consideration in balance with professional guidelines, and current and continuing research. Green conservation practices encompass the decisions made within the context of collection management and storage, any investigative, preventive or interventive measure, their documentation, the materials used, the frequency of treatment and long-term impacts. Green conservation reinforces and furthers the positive role of conservation in the sustainability of our culture.

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DESCRIPTION OF THE GREEN PARAMETERS

Green parameters descriptors for green conservation (further explanations below)

Hazard impacts on human and environment	G1	Toxicity and hazard metrics for the natural environment
	G2	Toxicity and hazard metrics for humans
Impacts on climate change	G3	Energy – Indoor climate control impacts
	G4	Energy – Consumption in approach/application
	G5	Energy – Conservation approach/treatment-associated materials/products to be used
Impacts on resources	G6	Availability – water & resource use
	G7	Availability - biodiversity impacts
	G8	Waste
Art work specific/ professional parameters	G9	Material/product selection and application method
	G10	Efficiency - Number of applications/consumption/ quantities of materials/products used
	G11	Longevity of result
	G12	Accessibility – availability of approach/used materials/ products
	G13	Accessibility – Ease of use and time
	G14	Quality/value impacts of result in meeting preservation goals

Hazard impacts on human and environment

G1 Toxicity and hazard metrics for the natural environment

Considers the information and data relating to the toxicity and chemical hazards/risks of a particular material/product for the natural/living environment when used within the specific process/approach/treatment, as well as the toxicity and hazards for the natural/living environment considering the entire life cycle of the material/product.

G2 Toxicity and hazard metrics for humans

Considers the information and data relating to the toxicity and chemical hazards/risks of a particular material/product for the human user within the specific process/approach/ treatment, as well as the toxicity and hazards for humans when considering the entire life cycle of the material/product.

Impacts on climate change

G3 Energy – indoor climate control impacts

Considers the energy use related to indoor climate control for the object/collection, considering general guidelines, existing controls in place and the prevailing outdoor location: also considering any change in the climate control needs of the object as a result of the approach/treatment under contemplation. Considers the energy sources being used (carbon-based, non-renewable, renewable).

G4 Energy – consumption in approach/application

Considers the energy use from consumptions directly related to the approach/application being considered (i.e. during the specific implementation process). This could include any analyses needed/carried out before and during treatment, any electrical tools used during active conservation, any transformations required by end-users at extremely low or high T°C (ambient, <5°C, <100°C, >500°C, >1000°C), any specifically related energy requirements for the premises (e.g. air extraction), specifically associated transportation for artwork/materials/human, documentation and digital storage. Considers digital sobriety and the energy sources being used (carbon-based, non-renewable, renewable).

G5 Energy – conservation approach/treatment-associated materials/products to be used

Considers the energy use associated with the manufacture, supply and disposal of the materials/products being used in the approach/application. Compares the *carbon footprint*/*GWP* of the manufacture of individual products if known (e.g. *STICH*), Where there is an assembly of several products, each one is identified and considered as far as possible.

Impacts on resources

G6 Availability – water & resource use

Considers the quantity of water used in creating the material/product and water requirements for the material/product and treatment/approach during use and disposal (e.g. for dilution). Considers whether pre-processed water or tap water is required (city, reclaimed, demineralized, ultra-pure) Considers other natural resources depleted because of the treatment/approach and materials/products being used (e.g. components in lighting/systems that rely on scarce mineral or ore sources). Considers the location of source extraction (local, national, regional, beyond). Considers social labor practices of the vendors and product manufacturers and considers human resource requirements for the approach.

G7 Availability - biodiversity impacts

Considers the direct impact on biodiversity from the materials/products used through their creation/manufacture. For example, glue or brushes made from an endangered species (red list).

G8 Waste

Considers the required disposal of the materials/products being used and a zero-waste hierarchy - whether they can be recycled, are biodegradable, can be repurposed or can be directly reused, whereby waste is avoided. Considers waste streams specific to the organization and region, the general need to avoid pollution/fouling the planet irrespective of direct effect on living organisms and applies best practices for hazardous waste.

Art work, cultural heritage object specific / professional parameters

G9 Material/product selection and application method

Considers the effect of combining the material/product and its application method within an approach/treatment for any change in potential impacts due to the specific combinations (e.g. solvent applied with either cotton swab, gel or tissue/preparing an enclosure with materials for eventual separation and re-use).

G10 Efficiency - Number of applications/consumption/quantities of materials/products used

Considers the quantity of material/product needed. Considers the amount used in a single application and the number of repeated applications required to achieve the desired result. Considers what can be reused and how much will be needed for the duration of the total process (hours, day, month or year).

G11 Longevity of result

Considers the lifetime of the treatment/result of the approach. Considers the durability/purity/quality of the materials/products added to the object within the approach/treatment. Considers the frequency of subsequent interventions/maintenance as a result of the approach (none, every year, 5 years, 10 years, > 10 years), and the type of maintenance that would be required (carbon-based, electrical (renewable, non-renewable), chemical, manual.)

G12 Accessibility – availability of approach/used materials/products

Considers the costs involved (qualitatively assessed by user) of the materials used in the approach/treatment, within the context of risk assessment and safe efficacy, Considers whether the materials are available as a commercial product for the user, whether they are already present (in the studio/lab/etc.) or need to be purchased, and considers the transparency of material/product information.

G13 Accessibility – Ease of use and time

Considers the ease of using the treatment/approach, materials/products, considering the working properties and the time needed for testing the approach/materials/product, and the time needed for carrying out the treatment/approach. Considers the potential professional/long-term benefits of any new method/innovative approach.

G14 Quality/value impacts of result in meeting preservation goals

Considers the quality and value impact of the material/product, treatment/approach in meeting preservation goals, e.g. success of treatment/remedial action in preventing deterioration/increasing public accessibility.

ADDITIONAL BACKGROUND/FAQ SECTION

How to Use/Implementation tips

- The parameters are intended to provide guidance in both theory and practice.
- 100 % green does not exist, and the parameters are not intended as an exhaustive list. One solution/approach will be greener with regards to some parameters, whilst another might be greener in others. There will always be a balancing aspect.
- The parameters can be considered in any order and depending on context. *An example would be examining different ways to condition enclosures (with an identical result) and considering the total energy implications of each.*
- The parameters can be considered in terms of only those decisions that are directly within the control of an individual professional or used to address the broadest aspects within a wider discussion involving multiple stakeholders. To support context specificity and agency, a weighting system to indicate big vs small impact items has not been applied.
- Further/future considerations can be added - if not specified here it is hoped/anticipated these can fall under one of the parameters.

Concept, Goal and Scope

- The normative definition describes what green conservation should be based on standards. The aspirational definition describes the ideal goals of green conservation.
- Conceptually aligned with a scientific attitude (care for empirical evidence, and willingness to change theory in the face of new empirical evidence), the definition and parameters aim to differentiate and broadly outline the unique characteristics of green conservation from a sustainability perspective.
- The definition and parameters are aspirational with the intention to guide clearer evaluations of green conservation in all aspects and disciplines within cultural heritage conservation, encouraging the use of reliable and comparable data where possible.
- It aligns with the circular economy

Background/Frameworks

- Developed from a sustainability framework, safe and sustainable by design, combining LCA, LCC, S-LCA approaches and alignment with principles of green heritage science e.g. inherently non-harmful, maximization of (safe) efficiency etc.
- Where possible, internationally recognized frameworks, data and metrics can be applied - such as the Globally Harmonized System (e.g. GHS in G1 and G2), LCA data (e.g. contributing in G1 through G7) and guidelines (e.g. BIZOT).
- Whilst certain quantitative frameworks can be applied to the parameters, other aspects can only be assessed qualitatively/comparatively and/or rely on context-specific primary data/inputs from the user.
- It is recognized that diverse frameworks of knowledge maybe further needed, with specifications and developments that respect the subjective nature of an artwork/cultural heritage's values, meaning and purpose.
- The parameters are grouped for clarity. Where certain effects/impacts could be theoretically considered in multiple parameters, an approach has been taken to avoid repetition and confusion by aiming to determine the **primary association** within the main impact categories specified *e.g. harmful impacts (toxicity and chemical hazards/risks) on non-human living organisms from disposal of a material are considered in G1 (which encompasses the entire life cycle). Other impacts that could be potentially linked, such as on biodiversity from the associated polluting waste for instance, would be subsequent/secondary knock-on effects.*

Disclaimer/Acknowledgements

It is acknowledged that the associated assessments are highly complex, and since not all future developments and socio-economic contexts can be foreseen, a timeless definition of green is impossible.

Authors and contributors

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