ICOM-CC
ICOM international council of museums – committee for conservation

COMMUNITY-LED TRAINING

Establishing a Foundation for Heritage Conservation in Africa

2024 ICOM SOLIDARITY PROJECT: COMMUNITY-LED TRAINING

VOLUME 2:

AGENTS OF DETERIORATION

2024 ICOM Solidarity Project:
Community-Led Training

VOLUME 2: AGENTS OF DETERIORATION

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INTRODUCTION

Whether your collection is metal, wood, canvas or panel paintings, fine art, organic materials, buildings, paper, or books; they will be constantly under threat by the basic agents of deterioration.

Understanding these agents of deterioration is the foundation upon which effective preservation strategies are built.

Johanna Ndahekelekwa Ndjamba

Use these four steps to ensure your preventive conservation plan is functional and effective.

PREVENTIVE CONSERVATION

1 AVOID

Use preventive conservation to stop agents before they can start.

2 BLOCK

Prevent agents from reaching objects with mitigating strategies.

3 DETECT

Presence of agent needs to be detected by inspecting objects for changes regularly.

4 RESPOND

Action is needed - decide timeframes, expectations, and urgency.

PHYSICAL FORCES

Impact

Fatigue

Pressure

Abrasion

Vibration

MITIGATION STRATEGIES

Handling

- Two-person lifts
- Proper supports
- Minimise glove-use
- Clear pathways

Transportation

- Custom protective packaging
- Secure Loading
- Climate Control
- Support for lightweight objects

Display

- Assess condition prior to display
- Stable bases
- Vibration dampening
- Strategic placing

Storage

- Adequate cushioning
- Correctly sized boxes
- Avoid stacking objects
- Ensure proper orientation

Image credit: Mudzunga Munzhedzi - KwaZulu-Natal Museum, South Africa

Theft

Vandalism

Intentional harm

THIEVES & VANDALS

MITIGATION STRATEGIES

Identify threats

- Unauthorised access
- High-value objects
- Vulnerable objects
- Restricted visibility

Protect

- Control staff access zones
- Lockable vaults and doors
- Secure display cases and barriers
- Visitor screening

Detect

- CCTV Installation
- Alarm Systems
- On-site security staff
- Staff training

Response & recovery

- Emergency response plans
- Regular security assessments
- Partnerships with law enforcement
- Establish public "sense of ownership" of heritage objects

Protection example:
Secure cabinets that still allow visitors a clear view of the objects on display ensure safety.

Image credit: Peter Chitungu - Choma Museum, Zambia

FIRE

Flames

Smoke

Heat

MITIGATION STRATEGIES

Risk assessment

- Identify ignition sources
- Weaknesses in building layout
- Identify vulnerable objects
- Limit "risky" activities (eg. leaving a heater unattended)

Prevention plan

- Fire protection equipment
- Detection systems
- Practise electrical safety
- Fire-safe storage solutions

Emergency strategy

- Evacuation plans
- Notification procedures
- Notify authorities
- Prioritise the protection of valuables

Review & improve

- Thorough documentation
- Staff training and drills
- Regular risk assessments
- Improve issues found through drills

Prevention example:
Easily accessible fire extinguishers allow for immediate response.

Image credit: Kolawole Adeyra - Museum of Unity Ibadan, Nigeria

WATER

- Floods
- Leaks
- High humidity
- Water-related incidents

MITIGATION STRATEGIES

Vulnerabilities

- Proximity to large bodies of water
- Infrastructure/maintenance issues
- Pipes, windows, skylights, and HVAC systems
- Objects made of organic material

Prevention plan

- Drainage around building
- Maintain roof, gutter, and plumbing
- Construction/renovation protocols
- Mobile storage units for easy relocation

Emergency strategy

- Safe evacuation routes
- Immediate response plan
- Health and safety precautions
- Maintain a readily available supply of emergency materials

Recover & treat

- Download the free FAIC ERSApp
- Document and analyse incident
- Use fans and dehumidifiers
- Clean and sanitise objects to prevent mould

Image credit: Catherine Snel - Sanlam Archives & Museum, South Africa

Insects

Rodents

Other animals

PESTS

MITIGATION STRATEGIES

Detection

- Inspect incoming objects/specimens
- Use monitoring tools such as glue traps
- Know common signs of infestation
- Regular Inspections

Prevention

- Regular inspections and cleaning
- Eliminate potential breeding grounds
- Use physical barriers to prevent pests from entering
- Minimise food sources

Eradication

- Isolate immediately and clean area
- Use heating and freezing treatments
- Consider non-toxic controls before chemical options
- Seek professional help for fumigation

Evaluate & record

- Record sightings
- Keep photo records
- Note environmental conditions at the time
- Monitor effectiveness of pest management

Image credit: Joseph Phiri - Moto Moto Museum, Zambia

POLLUTANTS

- Dust
- Dirt
- Gases
- Particulate matter

MITIGATION STRATEGIES

Risk assessment

- Dust and particles (eg. soot)
- Gaseous pollutants (eg. off-gassing from wood varnish)
- Chemical pollutants (eg. cleaning agents)
- Biological contaminants (eg. mould and fungi

Prevention plan

- Temperature and humidity
- Air quality
- Pest population and species
- Set dates for regular visual inspections and be sure to note any changes in objects such as debris or fading

Emergency strategy

- Maintain HVAC systems
- Install dust proof doors and windows
- Use protective storage
- Use protective display techniques

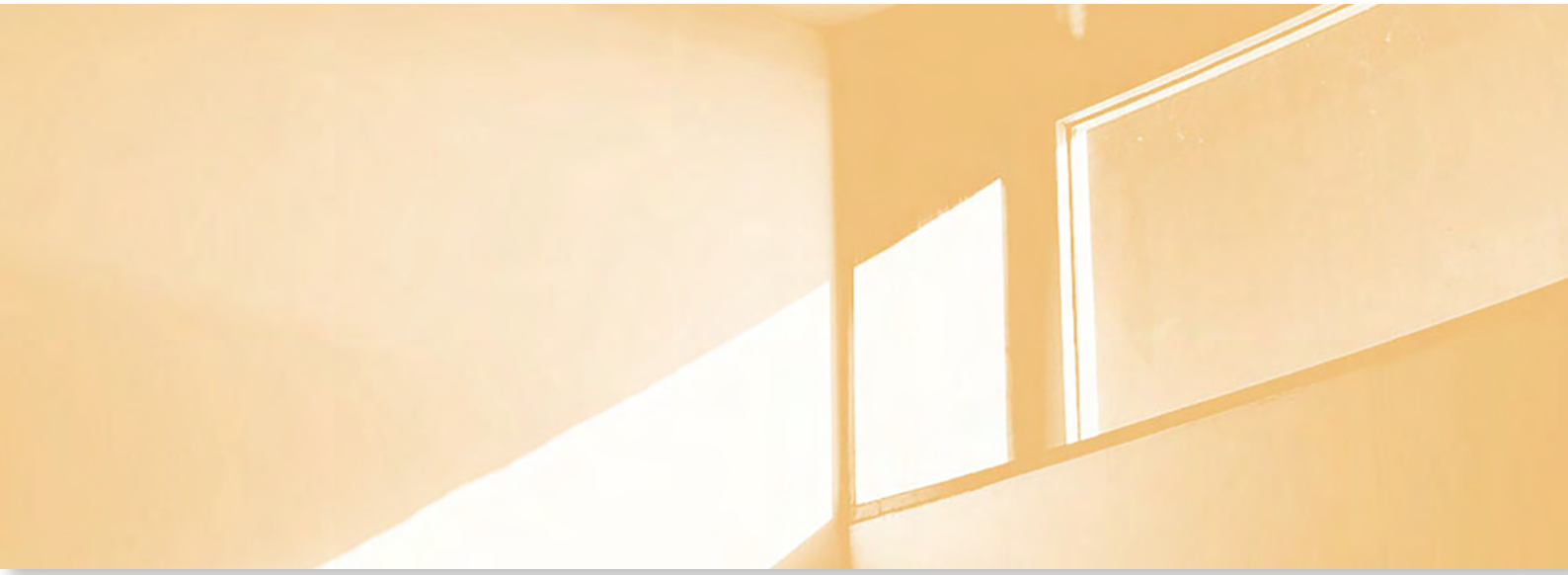
Review & improve

- Use non-toxic materials
- Use barrier coatings or consolidants on sensitive objects
- Install dust mats at entrances
- Train staff on handling, storing, and exhibiting items

Pollutant example:
Dust sticks to wood easily due to static electricity and surface texture, and needs to be removed through surface cleaning procedures.

Image credit: John Osin - Benin Museum, Nigeria

LIGHT & UV RADIATION



Fading

Discolouration

Weakening

MITIGATION STRATEGIES

Types of light

- Visible light
- Ultraviolet (UV) light
- Infrared (IR) light
- Light is measured in "lux" - the measure of how much light hits a surface

Effects of light exposure

- Fading and discoloration
- Material weakening
- Temperature fluctuation caused by IR light can accelerate degradation
- Dangerous photochemical reactions can be triggered by light

Light management

- Lower intensity through LED lighting, dimming, and timer
- Display techniques such as strategic lighting and rotation of exhibition
- Filter with UV filters and screen with window covers
- Light meters and regular inspection

Suggested light levels

- Light levels should be set according to object sensitivity
- Low sensitivity: ~150 to 300 lux (eg. metal or ceramics)
- Moderate sensitivity: ~50 to 150 lux (eg. paintings and textiles)
- Highly sensitive objects: >50 lux (eg. photographs and documents)

Image credit: Celiwe Dlamini - Eswatini National Museum, Eswatini

INCORRECT TEMPERATURE

Cold

Heat

Temperature fluctuations

MITIGATION STRATEGIES

Temperature fluctuations

- Expansion and contraction
- Increased chemical reactions
- Condensation
- Relative humidity problems

Vulnerable materials

- Wooden objects
- Textiles and leather
- Paper and photographs
- Metals

Too hot or cold

- High: Deforming, weaken, or melting of plastics
- High: Adhesives can become unstuck, especially if combined with high RH
- Low: Polymers can become stiff or even brittle
- Low: Paintings become more vulnerable to impact damage

Preventive measures

- Implement climate control, use HVAC systems if possible
- Lighting control
- Regular monitoring
- Control exhibition design and storage solutions

Prevention example: Window dressings, air conditioners, and fans can all aid in keeping temperature more constant.

Image credit: Whinnyfred Anosike - Lagos Museum, Nigeria

INCORRECT RELATIVE HUMIDITY

Too high

Too low

Fluctuations

MITIGATION STRATEGIES

Fluctuation sources

- Local climate (rain, temperature, and dew point)
- Heating and cooling systems
- Poor surface and/or soil drainage
- Exterior walls

Impact of fluctuation

- Mould growth
- Warping and cracking
- Attraction of pests
- Acceleration of metal corrosion

Control & monitor

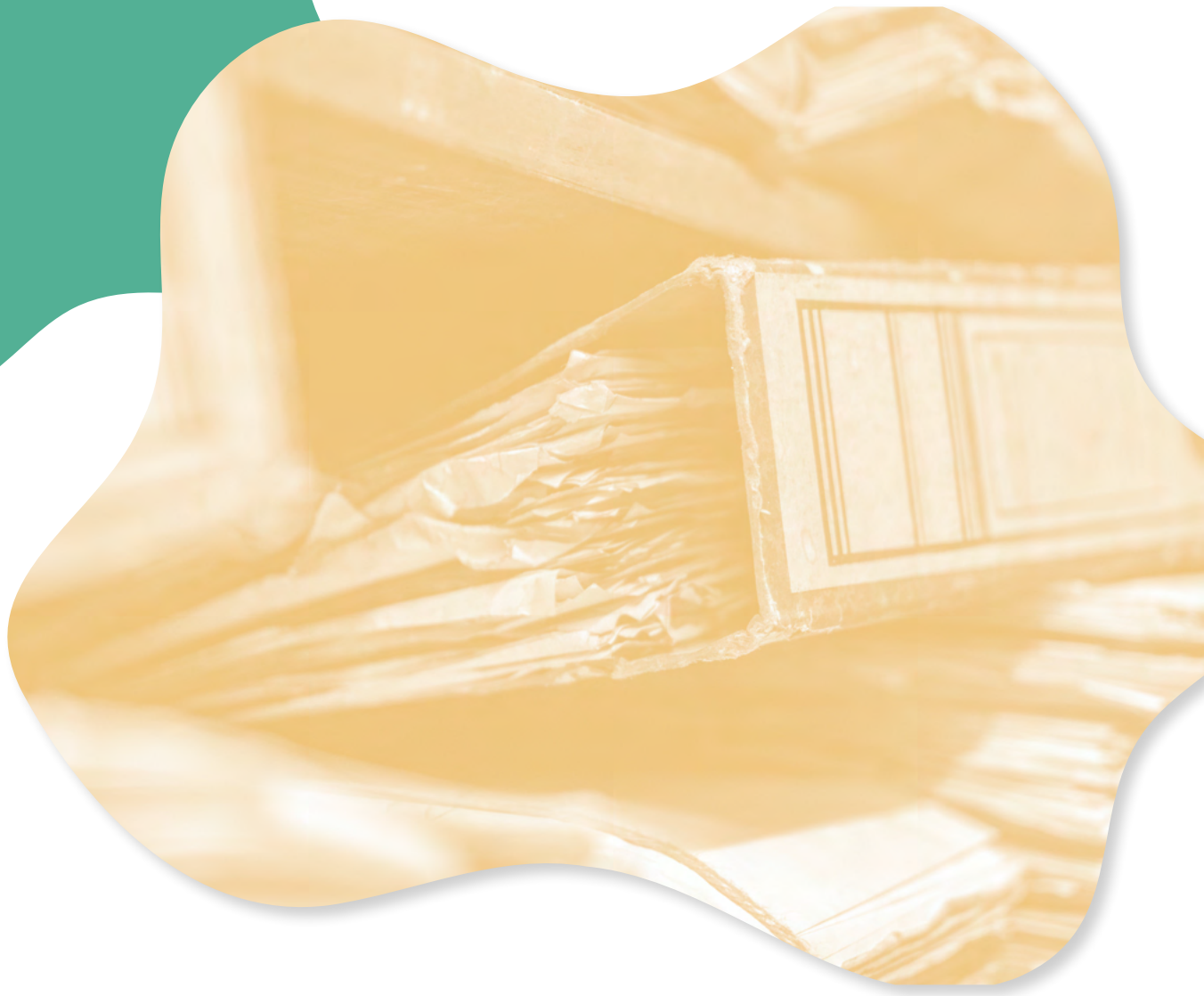
- HVAC systems maintain a stable temperature
- Hygrometers and data logs to monitor levels over time
- Humidifiers and dehumidifiers to keep humidity levels stable
- Aim to maintain desired relative humidity range - typically 40-55%

Preventive measures

- Ventilation
- Store objects with desiccants in acid free boxes, sleeves, or containers
- Regularly inspect collections
- Train staff on humidity control procedures

Control example: Dehumidifiers help to control the environment, ensuring a more stable humidity range to be achieved.

Image credit: Marike Beyers - Amazwe Museum of Literature, South Africa



DISSOCIATION

Damage

Item loss

Information loss

MITIGATION STRATEGIES

Causes of dissociation

- Custodial neglect
- Inadequate record-keeping
- Improper handling
- Lack of standardised documentation procedures

Impact

- Diminished value, historical meaning, cultural relevance, and context
- Increased risk of theft or misplacement
- Challenges for conservation efforts
- Loss of donor and public trust

Label & locate

- Consistent naming practises with durable labelling
- Use system to track movements
- Regular audits of presence and condition of objects
- Regular staff training with clear accountability

Document & control

- Access-controlled central database
- Regularly backed up digital records
- Standardised procedures for documenting changes or new acquisitions, loans, and exhibitions
- Regular audits of presence and condition of objects

Labelling example:
Various labelling methods are available that will suit the needs of any type of object.

Image credit: Rebecca Naidoo - Old Court House Museum, South Africa

MAINTENANCE & HOUSEKEEPING

Planning and maintaining a schedule is crucial. It ensures that preventive measures are adhered to, which will help deter the agents of deterioration before they can get to any objects. See an example of a schedule on the next two pages.

For me, it's a dedicated job and a museum object requires the attention of its conservator, like a newborn or a growing child. The way a mother keeps checking on kids' activities, and notices a slight change in his/her routines, a conservator is required to keep a regular check on an object.

Zahida Quadri

DAILY

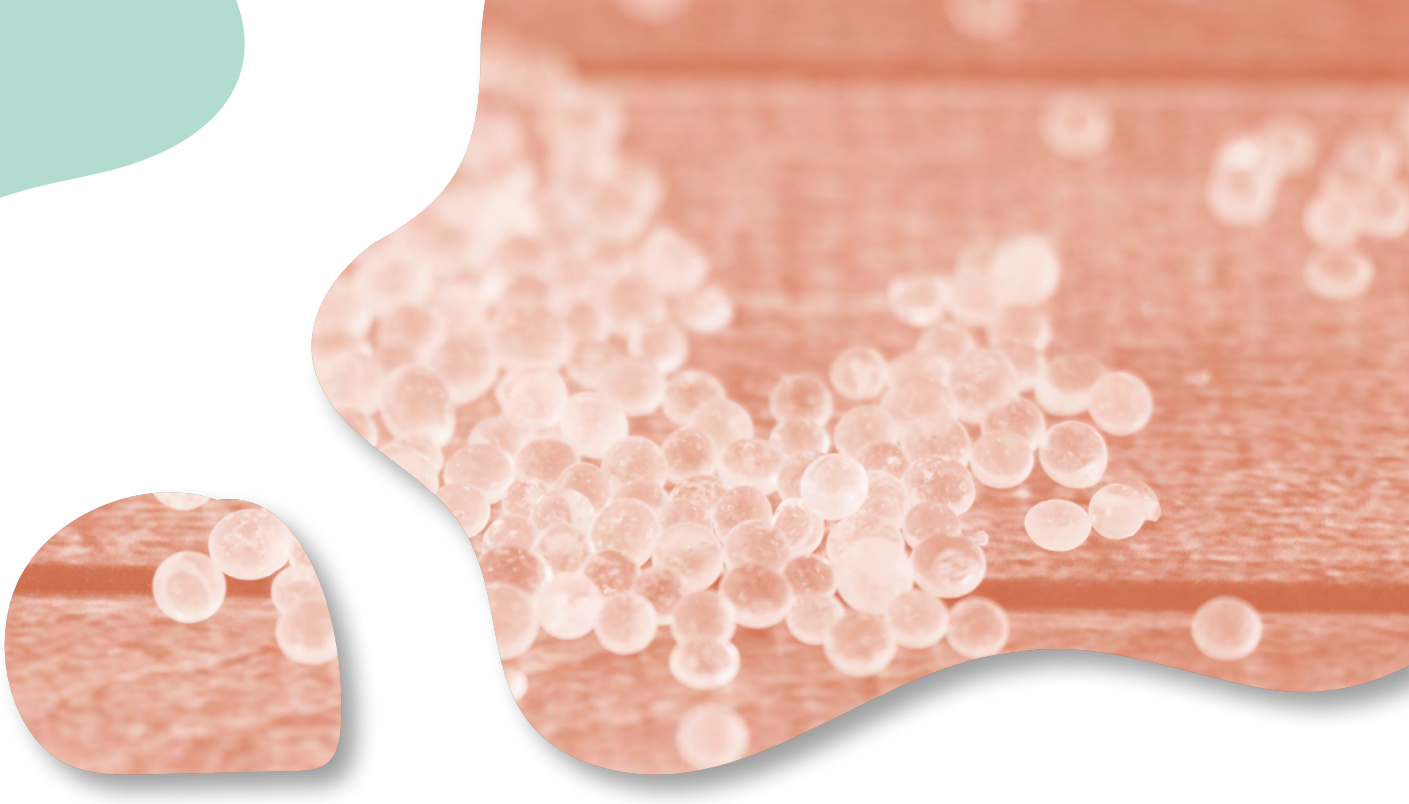
- **Dusting**
  Gently dust surfaces, especially in high-traffic areas and around exhibits, preferably with a soft microfiber cloth.
- **Climate Control**
  Closely monitor and log temperature and humidity levels, adjusting the HVAC system as needed.
- **Visitor Areas**
  Maintain clean and welcoming visitor spaces, including restrooms.

WEEKLY

- **Deep Cleaning**
  Thoroughly clean display cases, shelves, and floors, but ensure no cleaning products come into contact with artefacts.
- **Pest Control**
  Check pest traps and visually inspect for any signs of pest activity like frass.
- **Lighting**
  Check that all lighting is working as it should and adjust if needed to minimise UV exposure to artefacts.

MONTHLY

- **Artefact Condition**
  Visually inspect all artefacts for damage or deterioration and document any findings.
- **Inventory**
  Confirm that all items are present and correctly located according to their reports.
- **Light Management**
  Routinely rotate exhibit areas and objects to manage light exposure.
- **Conservation Planning**
  Identify items that require immediate conservation and plan for professional treatment.



QUARTERLY

- **Climate Adjustment**
  As the seasons change, review and adjust and maintain the HVAC system and dehumidifiers including changing air filters.
- **Specialised Cleaning**
  Enquire for specialised cleaning of delicate artefacts from conservation professionals.
- **Staff Training**
  Routinely rotate exhibit areas and objects to manage light exposure.

ANNUALLY

- **Full Inventory**
  Complete a comprehensive inventory and condition assessment of the entire collection.
- **Specialised Cleaning**
  Review artefact conditions and note future conservation projects to prioritise.
- **Visitor Feedback**
  Analyse visitor feedback and assess visitor engagement to improve maintenance and exhibit presentations.

CONCLUSION

Image credit: Kolawole Adeyra - Museum of Unity Ibadan, Nigeria

> *By examining these concepts, we are essentially attempting to safeguard the future of our past by ensuring that the collections that define our history are protected for future generations.*

Joseph Ssebunya

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