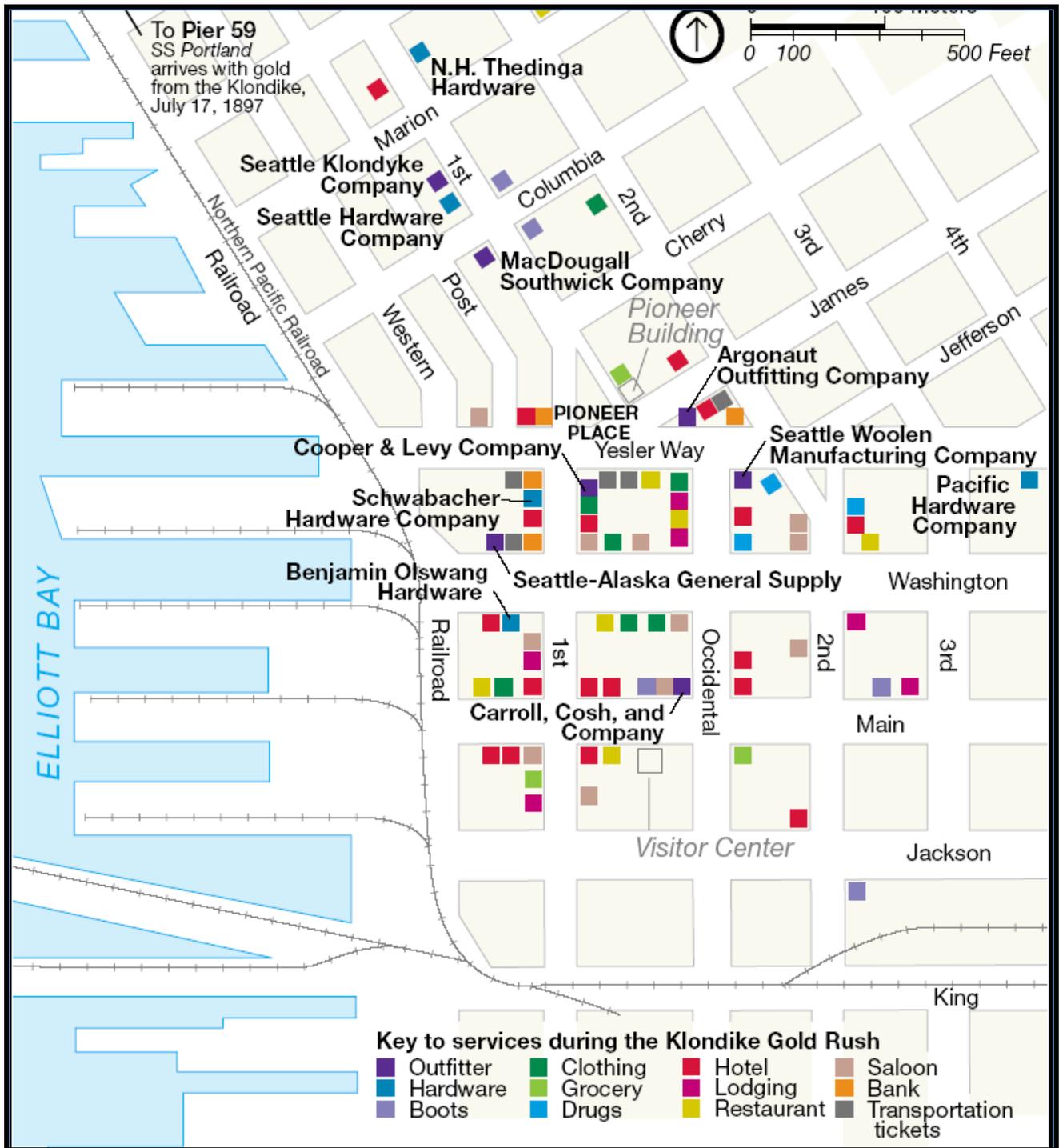


**Klondike Gold Rush
National Historical Park, Seattle**

Museum Preservation Maintenance Plan



**Department of the Interior
National Park Service
Pacific West Region
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Klondike Gold Rush National Historical Park, Seattle Unit Museum Preservation Maintenance Plan

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Executive Summary

Preventive conservation is the use of techniques to avoid, block, or minimize the agents of deterioration (chiefly temperature, humidity, light, and pests), which adversely impact museum collections. Such practices allow museums to limit collections deterioration and can minimize the need for expensive and time-consuming conservation treatments.

Vital to park preventive conservation programs is a Museum Housekeeping Plan. Director's Order #24 requires parks to "...Approve, keep current, and implement a Housekeeping Plan for every space that houses museum collections, to ensure that housekeeping routines are sensitive to museum collections preservation needs." A Housekeeping Plan quantifies the park's preventive conservation needs. It:

- considers the nature and condition of museum collections
- notes the location of museum collections
- specifies both routine housekeeping tasks and special housekeeping projects
- lists needed equipment, materials, and proper techniques
- identifies staff persons responsible for carrying out housekeeping tasks
- establishes a schedule for completing each task and records its completion

In the Pacific West Region, the Museum Preservation Maintenance Plan replaces the Housekeeping Plan. This more holistic document includes a broader range of factors:

- the condition of museum buildings, park infrastructure, and related utilities
- environmental factors, both interior and exterior, and special climatological data
- any other issues which may negatively impact the collections

Once these factors are identified, the Museum Preservation Maintenance Plan addresses each one, in the most effective and practical way, based upon present staffing and funding. If current and anticipated programming levels are insufficient, the Plan may suggest interim measures using existing resources while at the same time suggesting potential long-term remedies.

By utilizing such a holistic approach, the Museum Preservation Maintenance Plan provides the park's museum staff not only with a technical "how to" guide for collections care but also serves as a strategic planning document to assist in the park's overall museum management program.



Figure 1. The main entrance to the Park. Note the grate in the sidewalk that is open to the building areaway below.

Introduction

This *Museum Preservation Maintenance Plan* was developed to provide the museum staff at Klondike Gold Rush National Historical Park, Seattle Unit (KLSE), with critical information and guidance to assist in developing and implementing a regularly-scheduled preventive conservation program that meets NPS standards and which is consistently carried out. The development and implementation of a Museum Housekeeping Plan (replaced by the Museum Preservation Maintenance Plan in the Pacific West Region) is a Servicewide museum management requirement.

The plan notes the current conditions in which the collections are stored and exhibited. These include light levels, both visible and ultraviolet; temperature and relative humidity levels and their fluctuations; the amount of dust/dirt in the facility; the condition of the facility; how often, and with what, the facility and collections are cleaned; and the presence of pests or attractants to pests. It then compares the current conditions with the NPS standards for the preservation of museum collections. Finally, the Plan outlines recommendations and guidelines which formalizes responsibilities, establishes schedules, and coordinates the tasks for improving the current conditions, if needed, to bring them up to NPS standards.

The *Klondike Gold Rush, Seattle Preservation Maintenance Plan* was drafted during a site visit in July of 2007 in collaboration with Pacific West Regional Staff Curator, Steve Floray, KLSE Interpretive Ranger, Keith Routley (who has collateral duty responsibilities for managing the museum collections), and Mount Rainier Curator Brooke Childrey (who is the Curator of Record for KLSE). Ranger Routley, in preparation for this plan, drafted a housekeeping plan for KLSE. This plan was used, in part, to draft the Preservation Maintenance Plan. Photographs were provided by KLSE Collateral Duty Curator Keith Routley.

Director's Order #28: Cultural Resource Management and *Director's Order #24: NPS Museum Collections Management* require that every space housing museum collections has a written museum preservation maintenance plan (MPMP). The MPMP is a comprehensive document that covers the existing condition (both interior and exterior) of buildings housing artifacts and the existing condition of museum exhibits and storage areas. It makes recommendations for improving these conditions to bring them closer to NPS museum standards and it outlines housekeeping tasks for maintaining the artifacts.

Collection maintenance is exacting and time consuming work, and has the potential to greatly increase the “life” of museum collections. It involves environmental monitoring, integrated pest management, monitoring the conditions of individual items, and if needed, direct interventions by a curator or conservator using specific preventive conservation techniques to reduce and/or address the various agents of deterioration.



Figure 2. The Cadillac Hotel building in the 1920s.

Preservation Maintenance Plan

Purpose and Scope

Deterioration of museum objects often results from adverse environmental conditions in which they are stored or exhibited. A preservation maintenance (or housekeeping) plan is an organizational effort to help slow and/or minimize these effects. It formalizes responsibilities, establishes schedules, and ensures coordination of tasks, so that care can be consistently carried out.

Museum collections and their individual objects continually interact with their surrounding environment; extreme conditions greatly hasten an objects' (or collection's) deterioration. Dust levels, temperature and humidity levels, light levels, and pest infestations all have a direct impact on the long term physical integrity and stability of the objects.

Without a written preservation maintenance plan, the realities of shared responsibilities for preventive conservation can lead to misunderstandings about what tasks are required, who carries them out, and how often they need to be done. If the plan is to be a useful tool for the park, it must take into consideration current practices, available staff and time, visitation levels, the physical environment, specific requirements of the collection, and equipment and supplies. These various aspects have all been taken into account in the plan's preparation. As the *Museum Handbook* notes, housekeeping is as much planning and monitoring as it is hands-on collection care. Sometimes it is just as important knowing when not to clean as knowing when and how.

This plan provides the staff of Klondike Gold Rush National Historical Park, Seattle with guidelines for the maintenance and preservation of the collections and the building housing the collections. The plan defines the preventive maintenance tasks, who does them and how often, and includes suggested scheduling formats for recording tasks completed during each maintenance interval. A resource list of equipment suppliers and a bibliography of useful references are included at the end of the plan. The suggestions and schedules given here should be used as a basis for ongoing evaluation as conditions change. While the plan outlines tasks and frequencies, the staff will need to fine tune the process to ensure a useful and flexible tool which can rise to various occasions that may not be specifically addressed. As in all National Parks, the care of collections should meet NPS standards as outlined in *DO#28 and #24* and the *NPS Museum Handbook* (Parts I and II).



Figure 3. The Cadillac Hotel building soon after the earthquake in 2001.

Current Responsibilities

Preservation of museum collections is a shared responsibility. The *Museum Handbook*, Part I, Chapter 3 lists the following park staff responsibilities related to museum collections:

The curator:

- Monitors and assesses condition of objects.
- Monitors and evaluates the museum environment.
- Practices proper methods and techniques for storing, exhibiting, handling, packing and shipping of objects.
- Develops, coordinates, and implements an ongoing housekeeping program for collection spaces.
- Prepares an emergency management plan for museum collections.
- Prepares an Integrated Pest Management Program for museum collections.
- Coordinates the park's Museum Preservation Maintenance Plan.

Other park staff:

- Provide guidance, in their area of expertise, on effective means of achieving preservation standards for museum objects.
- Alert the curator to impending activities that may impact museum collections but that are not addressed in the Museum Maintenance Preservation Plan.
- Implement the actions in the Museum Preservation Maintenance Plan for which they are responsible.
- Implement the actions in the housekeeping program for which they are responsible.
- Prepare park-wide Emergency Management Plan.
- Prepare the park-wide Integrated Pest Management Plan.

- Assist in development and annual review of both the Museum Preservation Maintenance Plan and the park's housekeeping program.

These lists show the ideal scenario and all parks strive for this level of development. At KLSE there has never been a full time Park Curator on staff and, as is now the case, the curatorial responsibilities are delegated as a collateral duty to a member of the interpretive staff. The Collateral Duty Curator has typically performed the curatorial responsibilities during project time, which is often unavailable or frequently interrupted. Other interpretive staff members have provided assistance with some aspects of the museum operation. The University of Washington Museology program has been a source of student intern assistance.

The janitorial service for the park building, ACME Maintenance, is contracted for by Historic Seattle and included in the park lease agreement, and provides services after hours. The primary contact for building maintenance, cleanliness, and environmental concerns is the Building Manager at Historic Seattle. S/he can be reached by telephone at 206 622 5444, ext. 235. Historic Seattle contracts out maintenance, utilities, repairs, and the alarm system. The park is responsible for exhibit maintenance and artifact care.



Figure 4. Inside the building main entrance at the beginning of the museum exhibits.

Environmental Impacts on Collections

A variety of environmental factors contribute to the deterioration of collections. While understanding potential problems and knowing safe environmental parameters is useful, constant vigilance based on that knowledge is necessary to safeguard the collections. The following environmental issues are of most concern. For more information see the *Museum Handbook*, Part I, Chapter 4.

Relative Humidity (RH) and Temperature

Relative humidity and temperature are two of the most important factors that play a large role in the long term condition of museum objects. The appropriate level of humidity and temperature is necessary for objects made from varying materials, but stability of the environment is even more important. Fluctuations of more than $\pm 5\%$ in one day or over a month can be very damaging, particularly to organic materials. High temperature and humidity (65% or higher) encourage the formation of mold and mildew, and attract a variety of pests which can damage or destroy an object. Rapid changes in Rh and temperature cause physical stress and chemical deterioration of museum objects. NPS Museum standard for temperature in museum collection storage areas and exhibit areas is 65-68 degrees; higher temperatures can accelerate the deterioration of collections; and when combined with excessive levels of relative humidity, such deterioration can quickly become catastrophic.

The relative humidity standard for NPS museum collection storage and exhibit areas is a constant Rh between 45% and 55%, adjusted for regional climactic conditions, as appropriate.

Dust

Dust is composed of many materials: fine particles of loose surface soil, pollen, combustion by-products, textile fibers, hairs, flakes of dead skin, dust mites, and food, to name a few. It varies from season to season, and place to place. Dust is quite abrasive and can scratch shiny surfaces and wear off fine surface detail. For this reason, dusting should always be based on the need and the condition of the object. The object's medium, its location, and the varying conditions that allow dust to accumulate also determine the frequency of dusting.

Pest Infestations

Rodents and insects such as silverfish and dermestid beetles can do great damage to collections. They are attracted by high humidity, clutter, dust, food, and plants. One aspect of preservation maintenance is to monitor for pests and keep detailed records of what is found so that species and seasonal and location factors can be identified and addressed (see *NPS Museum Handbook*, Part I, Chapter 5: Biological Infestations). One of the best preventive measures to follow is to maintain good housekeeping standards. Clean areas deny insects food and places to hide; keep

food out of any area where artifacts are stored and exhibited. Seal cabinets and exhibit cases housing museum collections so that insects cannot enter. Since high temperatures and relative humidity create ideal breeding grounds for pests, the control of these environmental factors is a must. For additional information and assistance contact the Regional IPM Coordinator or the Regional Curator.

Light

Intensity of light may be of concern when collection objects are exhibited on a regular basis. Acceptable light levels vary, depending upon the item, but should never exceed 300 lux (30 foot candles) for visible light and 0 microwatts/lumen for ultraviolet light. Many NPS artifacts are highly sensitive to light, both natural and artificial. Such items include: book covers, inks, feathers, furs, leather and skins, paper documents, photographs, textiles, watercolors, and wooden furniture. Objects so highly light-sensitive should never be illuminated by light levels that exceed 300 lux (30 foot candles).

It is important to note that damage as a result of exposure to light is cumulative—it cannot be reversed. ***“Low light levels for extended periods cause as much damage as high light levels for brief periods.”*** For additional information, refer to the NPS *Museum Handbook*, Part I, Chapter 4.

Artifact vs. Exhibit Prop

NPS Artifact definition: Historic object or document historically associated with the Klondike Gold Rush in Seattle or period pieces (historic objects/ "antiques") not associated with the Gold Rush but from the same era. Period pieces are usually purchased at used bookstores or antique stores as "exhibit props." The NPS recognizes period pieces as artifacts and not "props." Props are modern day objects such as moulds made specifically for exhibition. For example: A taxidermy specimen of a pika is an artifact. A mould of a pika is a prop.



Figure 5. Deteriorating brick and chew marks in the wallboard.

Current Conditions: Specific Information

Collections Storage

The Collection Storage Room is located in the basement of an 1890 historic building on an exterior wall. Only wallboard separates the collection room from the ventilation areaway and the outside. There is no insulation between the areaway and collections storage and the areaway is very damp and open to exterior air movement and outdoor conditions. There are no windows in this room and it is illuminated by fluorescent light fixtures whose bulbs are covered with UV light filtering sleeves. The dust accumulation in the collection storage appears relatively light with flat cabinet and table surfaces accumulating the majority. There have been no infestations of pests in the collection storage room. Sticky traps set in the room have trapped two small spiders over the year. The bottom of the entrance door has a double brush seal installed and there are no other known openings. A majority of the collections are stored in cabinets which are providing some stabilization of environmental conditions for the artifacts within. The remaining artifacts are stored on top of the cabinets. The room has a desk and a small work area for the collateral duty curator to care for the collections. The collection storage room has a separate thermostat system from the rest of the building and is being monitored by a Datalogger. Next to the collection storage room is a storage room for the bookstore, as well as general storage for the park and access to the areaway.

Besides the room being used for a dual function (collections storage and work room) and the obvious signs of "filled to capacity" (artifacts on top of cabinets), the collection room's primary concern is the wide temperature and relative humidity extremes; which, as noted in the previous section is quite damaging to artifacts.

During the period from January 19, 2007 to July 20, 2007 the Datalogger recorded temperatures ranging from 58 to 70 degrees and relative humidity fluctuations from 35 to 72%. Over a 2 week period the temperature ranged between 58 and 64 degrees and 42 to 65% relative humidity (Too wide a range of fluctuation).

Ideally, both the temperature and the relative humidity should be constant year round. However, such conditions are nearly impossible to achieve within a historic structure, especially one located within a marine environment such as Seattle. At the same time, building systems to solve such problems for collections can harm the historic structure, be exceedingly costly to install and maintain (high life cycle costs), and often are not wise choices based on the Service's environmental ethic. The wide swings in both temperature and the relative humidity in the collections room indicate that it is being affected by its proximity to the areaway and outdoor environment. At the same time, the current building-wide HVAC system is potentially unable to provide a proper museum environment here. Finally, other individuals may have been re-setting the thermostat.

To provide for a proper museum storage environment (unless collections in storage are relocated to another suitable facility), the park is encouraged consider relocating the collection storage room to an interior space away from the building's outer envelope. Such an interior space should be assessed to determine if any additional upgrades are necessary, such as a small dedicated HVAC system, additional insulation, etc. At the same time, due to the difficulties inherent in achieving an "ideal" museum environment within a historic structure, the park is encouraged to house all collections in storage within enclosed cabinets. Properly sealed museum storage cabinets provide an important level of protection from the various agents of deterioration; their success in "buffering" such conditions is widely recognized.

Exhibits

The exhibits are located on two levels of the historic 1890 building. One side of the basement level exhibits backs up against the areaway and in many places with only ¾ inch wallboard to separate the exhibits from the areaway. An inspection of the areaway revealed that it was an underground passageway with direct access to the street. It is exposed to the elements at the staircase end which has a grate for security. The areaway was being used to store boxes, equipment, paint cans, and other materials. Rats, other rodents, and pest have inhabited the areaway.

The brick walls of the exhibits are exhibiting signs of efflorescence (leaching salts). Two conditions must be present to create efflorescence:

1. A source of water soluble salts.
2. Water moving through the material to carry the salts to the surface. The water evaporates and leaves the white powder behind.

Water sources can be:

- IN/OUT - Entering at the surface (rain or sprinklers), penetrating in a fraction of an inch, and then returning to the surface carrying the salts.
- THROUGH - Entering from behind (bad flashing, caulking, leaks) or underneath (water from the earth migrating up) and traveling through.

There are two kinds of efflorescence.

1. Regular "powdery" efflorescence as described above and is still gone after "Efflorescence Treatment" dries.
2. "Crystalline" efflorescence. When powdery efflorescence goes through cycles of being deposited on the surface - re dissolved when new water occurs - drying out - new water - etc. it can form crystals. The crystals become tightly bonded to the surface. The crystals do not have to be thick. A light haze that is still there after using "Efflorescence Treatment" will be light crystal formation and is treated as described below.

It is important to note that the efflorescence may be encouraged by the installation and use of a closed HVAC system within the building. The park is encouraged to work with the Regional Curator, Regional Historical Architect, and other appropriate subject matter experts to develop a suitable response that addresses both the building and the collections.



Figure 6. Exhibit gallery hung artifacts and photographs.



Figure 7. Exhibit lighting on collection artifacts.

Museum Lighting

Track lighting is used to illuminate the exhibits. Additionally, floor to ceiling windows are present in the Temporary Exhibit Room and in one section of the main floor exhibit. UV film has been placed on the windows in the Temporary Exhibit Room.

During the July site visit, the team monitored light levels (both visible light and ultraviolet [UV] light) at various locations throughout the visitor center. Overall, light levels in many areas of the building, especially in the exhibit gallery, exceed NPS and accepted museum standards.

For example, when assessing the “Klondike Gold News” exhibit, which features period newspapers and books, the team observed the following readings:

1. At the window: 4 microwatts/lumen of UV and 41,569 lux of visible light
2. Books (outside the acrylic exhibit case): 330 microwatts/lumen of UV and 45,953 lux of visible light.
3. Newspapers (outside the acrylic exhibit case): 424 microwatts/lumen of UV and 2698 lux of visible light.

Fortunately, the readings under the Plexiglas® top of the books' exhibit case were much less. They measured 219 microwatts/lumen of UV and 223 lux of visible light; however these levels are still far in excess of the NPS museum standard for paper collections: 0 microwatts/lumen of UV and 50 lux maximum of visible light.

Based on the team's analysis, visible and UV light levels are actually higher away from the windows due to the artificial lighting used to illuminate the exhibits. As illustrated above, the light levels are far in excess of museum standards. Unless the excessive levels of light are reduced as soon as possible, irreparable damage will occur to these collections. The park is encouraged to work with the Curator of Record and the Regional Curator to procure and install new lighting or rehabilitate the current system (if possible) to provide illumination at levels appropriate for collections preservation.

Other general lighting observations include:

- Only readings taken in the "Store Exhibit" and the museum collections storage room had acceptable UV readings of 0 microwatts/lumen of UV.
- Light levels in the Temporary Exhibit Room were 58 microwatts/lumen of UV and 45,302 lumens, despite having a UV filter on the window panes. Much of this added light intensity was also due to the light bulbs used in the track light system.

Temperature and Humidity

The exhibit areas share a thermostat that has a Cool setting of 74°F and a Heat setting of 70°F. The Temporary Exhibit Room may share the thermostat that is marked Theater. There is no temperature or relative humidity (Rh) monitoring equipment in any exhibit areas. The temperatures and levels of relative humidity in these areas are very difficult to control given the multiple exterior doorways and numerous visitors entering and exiting during the day. Another challenge to maintaining appropriate levels of temperature and humidity is the fact that access to the thermostats is not controlled; various park staff and building maintenance staff can and do reset the thermostats according to their individual level of comfort. Finally, due to the historic nature of the building, it is still somewhat difficult to maintain appropriate conditions in these areas as they are very much affected by the outside environment and heat from the lighting system.

During the site visit temperature readings in the exhibit rooms ranged from 68°F to 79°F depending on location. Relative humidity ranged from 54% to 58%. Temperatures in NPS exhibit spaces should not exceed 68°F. The levels of relative humidity in the Collection Storage Room ranged widely, depending on the location that was sampled. The South and West Walls (both of which are exterior basement walls) registered 57.4%. The East Wall (interior wall) had the lowest reading: 54.6%. The North Wall (another exterior wall) registered 61.7%. The areaway readings during the site visit were 70.8°F degrees and 60.8% Rh.

Pollutants

The amount of dust and pollution in the exhibit areas is significant due to impacts from outdoors:

- High levels of visitation/foot traffic.
- Exterior doors that are frequently open.
- The close proximity of the museum to city traffic and other pollutants.

In addition, there are at least two sources of indoor air pollution:

1. The building itself: The brick exposed on some interior walls is producing noticeable amounts of fine red dust and efflorescence.
2. Exhibit elements, particularly natural materials such as sawdust.

Fortunately, these effects are minimized to a large extent as the majority of artifacts on display are enclosed within exhibit cases. There are however, six artifacts on open exhibit; all of which are composed of either metal and/or wood.

Museum Pests

When the park first opened in 2006 there was noticeable evidence of rodent infestation. The evidence was mainly in the Lower Level exhibit area and on the third floor. The building manager hired an extermination company to set and monitor traps (Orkin). Since then there has been little evidence of infestation.

As indicated in the IPM Survey completed in February, 2006, there are many avenues of entry into the building particularly through the areaway. In addition, it was decided that the park would allow visitors to bring food and drink into the museum, the classrooms, and to after hours events in the theater and exhibit areas. Fortunately, most of the artifacts on exhibit are enclosed in tightly sealed cases and are relatively unattractive to pests compared to the numerous restaurants and other food sources in the local area. The artifacts would be attractive for nesting materials, but again, there are plenty such materials more easily accessible nearby.

Cleaning Products and Materials

During the site visit, the team assessed the janitorial closet which houses the various cleaning products and equipment used by the building's maintenance personnel. (Building maintenance cleans the floors and exterior surfaces of the exhibits, as well as other custodial duties in the offices, theater, bookstore, restrooms, etc.).

It appears that the maintenance staff relies primarily on a number of different harsh, corrosive, irritating, and potentially unsafe chemicals products (for both people and the environment) for cleaning. Feather dusters were found to be in use (which can easily scratch the surfaces they come in contact with).

Although most of the artifacts are under Plexiglas[®], the use of such caustic chemicals in the vicinity can still cause damage to the artifacts from the vapors. Consider switching to "green" environmentally-friendly products and diapers or polyethylene/nylon dust cloth (Dust Bunny[®] or similar brand) for dusting all surfaces including walls and exhibit cases.



Figure 8. Natural lighting of exhibit artifacts.

Curatorial Tasks

Collections Storage

Daily

- Quick inspection of collections room; water leaks, pest activity, etc. Note any problems on the daily weather log.
- Spot check temp. & humidity readings to ensure levels are within proper ranges.
- Note daily temperature-humidity data for Seattle on weather log.
- Empty trash each night.

Weekly

- Vacuum floor in Collections Storage Room.
- Dust storage cabinets and tops of archival boxes and other surfaces with a diaper (soft cloth) or Dust Bunny[®].
- Assess the area outside the entryway; vacuum if needed.

Bi-Weekly

- Monitor sticky traps and record findings and replace as needed. Check for insects that feed on proteinaceous material (silverfish, moths, dermestids).

Monthly

- Inspect cross section of collection object types (metal, paper, and textile) to make sure there is no evidence of rust, mold, or infestation.
- Download, record, and analyze results for temperature and RH readings from Datalogger and hygrothermograph.
- Review inspection report from Orkin Pest Control
- Check vacuum cleaner bag; replace if full.

Quarterly

- Monitor effectiveness of door bottom seal.
- Calibrate hygromograph using sling or aspirating psychrometer.

Semi-annually

- Dust/clean walls, and ceiling of collection room and exhibit areas thoroughly with soft cotton cloth (diaper) or DustBunny material.
- Dust fixtures (lights, etc.).

Annually

- Monitor effectiveness of fluorescent light bulb UV filters
- Shake out dust covers outside.
- Vacuum HVAC air intake/return vent.

Exhibit Spaces

Daily

- Monitor exhibit areas for signs of pests.
- Monitor exhibit areas for pest attractants and avenues of entry.

Weekly

- Dust exhibit cases.
- Dust unprotected artifacts.
- Clean exhibit cases with Brillinize[®] plexiglass cleaner.
- Monitor building alleyway for excessive trash, weekly.

Monthly

- Monitor temperature, Rh levels in exhibit cases.

Quarterly

- Monitor light levels in exhibit areas.

Semi-annually

- Monitor building areaway for pest infestation.

Annually

- Examine artifacts in protective cases and dust as needed.



Figure 9. Museum Collection Storage.

Recommendations

Note: Recommendations are in priority order (the first three recommendations can be implemented rapidly with little difficulty).

1. Remove trash can from museum area of visitor center (top of stairs); relocate near front entrance.
2. Institute a no food and drink policy for all rooms on the exhibit levels.
3. Establish access procedures for collection storage. Limit access to curatorial staff and other NPS staff with direct responsibility for the collection. (Sample standard operating procedures are available from the Regional Curator.)
4. Initiate a workload analysis for the park's Museum Management Program to assist in establishing staffing and funding needs. The workload analysis will be beneficial in determining if current staffing levels and work assignments are adequate to ensure that this *Museum Preservation Maintenance Plan* can be properly implemented. Contact the Regional Curator for assistance in developing a museum workload analysis.
5. Consider moving the collection storage room to an interior room; the smaller classroom that has no exterior walls should be evaluated for use as museum storage. **Note:** Collections storage areas should not be placed alongside exterior walls, as it is difficult to maintain a proper museum environment in these areas.
6. Reduce high levels of lighting in the exhibit gallery; light levels should be within NPS museum standards.
7. Consider switching to green cleaning products (see Resources, below, and *Conserve O Gram 2/21*).
8. Consider switching to diapers or polyethylene/nylon dust cloth (Dust Bunny[®] or similar brand) for dusting all surfaces including walls and exhibit cases.
9. Verify Datalogger readings with the Environmental Monitor, or send to ACR for recalibration.
10. Purchase additional Dataloggers and probes to monitor the interior environment of the specimen cabinets, exhibit rooms, and exhibit cases.
11. No one except the Collateral Duty Curator should set the thermostat in the collection storage room.

12. Contact the building alarm company to set the alarm keypad in the collection storage so that the motion sensors there are armed/disarmed separately from the rest of the building alarm.
13. Set the thermostats in the exhibit rooms to 68 degrees. Explain to staff that these thermostats are set to the highest acceptable level for exhibits and should not be adjusted for their comfort.
14. Install filtering material or shades/blinds on all exterior windows to ensure that light levels in exhibit areas are within NPS museum standards. One option are shades of mesh fabric material (Mermet[®] Solar Shades or equal), which does not obscure views out the window yet still blocks most harmful UV and visible light intensity. See Resources, below for procurement data.
15. Install a seal on the door to collections storage.
16. Determine if vents/intakes are potential entrances for pests.
17. Meet with building maintenance staff to determine if the theater and temporary exhibit space are on the same thermostat.
18. Remove boxes, paint cans, and other materials stored in areaway. Establish policy to not use areaway as storage.
19. Finish the wall between the areaway and the collection room and the exhibit room with insulation and additional wallboard.
20. Work with the NPS Historic Preservation Staff and/or NPS Conservators to determine the cause of the efflorescence and to either repair or stabilize the deterioration.



Figure 10. Building areaway debris.

Preservation Maintenance Task Schedules/Checklist

The following pages include a listing of the various preventive maintenance tasks in a schedule/checklist format. For ease of tracking, each calendar grouping of tasks (daily, weekly, monthly, etc.) is contained on a single page. These pages can be photocopied and kept in a binder for museum staff to use to ensure that each task is completed at the proper time. Each page includes:

- a listing of all tasks to be performed
- who is responsible to carry out the work
- a “check-box” for staff to initial and date when each task has been completed

Consistently carrying out each of these tasks within the various identified time intervals and utilizing these forms to track implementation ensures that each duty will be carried out at the proper time, using appropriate methods, techniques, supplies, and equipment, in a consistent manner that can be easily tracked to ensure that nothing is overlooked.



Figure 11. Exhibits in the visitors center lower level.

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Daily Tasks: Collections Storage

Week of _____

Initial and date upon completion of each task.

	Monday	Tuesday	Wednesday	Thursday	Friday
1. Quick inspection of collections room; water leaks, pest activity, etc. Note any problems on the daily weather log.					
2. Spot check temp. & humidity readings to ensure levels are within proper ranges.					
3. Note daily temperature-humidity data for Seattle on weather log.					
4. Empty trash each night.					

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Weekly Tasks: Collections Storage

Month of _____

Initial and date upon completion of each task.

	Week 1	Week 2	Week 3	Week 4	Week 5
1. Dust tops of storage cabinets and shelves.					
2. Vacuum the floor of the collections storage room.					
3. Vacuum outside entryway area around the door to collections storage, if needed.					
BI-WEEKLY: Check sticky traps; record any activity.		N/A		N/A	

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Monthly Tasks: Collections Storage

January – June _____

Initial and date upon completion of each task.

	January	February	March	April	May	June
1. Conduct a random sample inspection of collections; check for mold, mildew, infestation, etc.						
2. Download, record, and analyze Datalogger and hygromograph data.						
3. Review inspection report from Orkin.						
4. Check vacuum cleaner bag; replace if full.						

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 MonthlyTasks: Collections Storage

July – December _____

Initial and date upon completion of each task.

	July	August	September	October	November	December
1. Conduct a random sample inspection of collections; check for mold, mildew, infestation, etc.						
2. Download, record, and analyze Datalogger and hygromograph data.						
3. Review inspection report from Orkin.						
4. Check vacuum cleaner bag; replace if full.						

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Quarterly Tasks: Collections Storage

Calendar Year 2010

Initial and date upon completion of each task.

	Jan – Mar	April - June	July – Sept	Oct - Dec
1. Monitor effectiveness of door bottom seal.				
2. Calibrate hygrothermograph using sling or aspirating psychrometer.				

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Semi-Annual Tasks: Collections Storage

Calendar Year 2010

Initial and date upon completion of each task.

	June	December
1. Dust and clean walls of collections storage room and office.		
2. Dust and clean all light fixtures.		

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Annual Tasks: Collections Storage

December 2010

Initial and date upon completion of each task.

Date: Completed on			Completed by:		
1. Conduct UV light readings in all museum areas to ensure filtering film is still effective.					
2. Shake out dust covers outdoors.					
3. Vacuum HVAC air intake and return vent.					

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Daily Tasks: Exhibit Spaces

Week of _____

Initial and date upon completion of each task.

	Monday	Tuesday	Wednesday	Thursday	Friday
1. Monitor exhibit areas for signs of pests.					
2. Monitor exhibit areas for pest attractants and avenues of entry.					

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Weekly Tasks: Exhibit Spaces

Month of _____

Initial and date upon completion of each task.

	Week 1	Week 2	Week 3	Week 4	Week 5
1. Dust unprotected artifacts.					
2. Dust exhibit cases.					
3. Clean exhibit cases with Brillinize [®] plexiglass cleaner.					
4. Monitor building alleyway for excessive trash, weekly.					

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Monthly Tasks: Exhibit Spaces

Calendar Year 2010

Initial and date upon completion of each task.

	January	February	March	April	May	June
Monitor temperature, Rh levels in exhibit cases						
	July	Aug	Sept	Oct	Nov	Dec
Monitor temperature, Rh levels in exhibit cases						

Klondike Gold Rush National Historical Park, Seattle Unit
 Museum Preservation Maintenance Plan
 Quarterly Tasks: Exhibit Spaces

Calendar Year 2010

Initial and date upon completion of each task.

	Jan – Mar	April - June	July – Sept	Oct - Dec
Quarterly: Monitor light levels in exhibit areas.				
	June		December	
Semi-Annually: Monitor Building areaway for pest infestation.				
	Date: Completed on		Completed by:	
Annual (Each December): Examine artifacts in protective cases and dust as needed.				



Figure 12. Harrison Samuel Lucas in a Dawson City Studio during his trip to the Klondike in 1898. KLSE 397. Donated by Emily Crandall.

Resources

The following is a sampling of some of the vendors that stock some of the most commonly used museum preservation supplies and equipment. For a more exhaustive list, refer to *Tools of the Trade*.

Cleaning Products, Museum

Conservation Resources International
5532 Port Royal Road
Springfield, Virginia 22151
(800) 634-6932
www.conservationresources.com

Conservation Support Systems
924 West Pedregosa Street
Santa Barbara, California 93101
(800) 482-6299
www.silcom.com/~css/

Cleaning Products, Natural/Non-Toxic

Planet Natural
1612 Gold Avenue
Bozeman, MT 59715
(800) 289-6656
www.planetnatural.com

Distributor of Dr. Bronner's, Biokleen™, and others; also available at natural food stores and select supermarkets.

Dataloggers, Temperature and Humidity

ACR Systems Incorporated
Building 210 - 12960 84 Avenue
Surrey, British Columbia V3W 1K7
Canada
(800) 663-7845
www.acrsystems.com

Note: This vendor is on GSA contract;
Contract #GS-07F-5564R

Pest Traps

Summit Chemical Company
235 South Kresson Street
Baltimore, Maryland 21224
(800) 227-8664
www.summitchemical.com

Vacuum, HEPA, adjustable speed

Miele, Incorporated
9 Independence Way
Princeton, New Jersey 08540
(800) 843-7231
www.miele.com

Miele dealers are located across the United States.

Window Shades/Solar-control Fabric

3G Mermet Corporation
5970 N. Main Street
Cowpens, SC 29330
(866) 902-9647
www.mermetusa.com



Figure 13. Documents and trunk belonging to John F Hielscher, a Klondike stamper and Alaskan businessman from 1898 to 1914. KLSE 445.

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Available on the web at:
<http://www.nps.gov/history/museum/publications/consveogram/conserv.html>.
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- _____. *Tools of the Trade*. Washington, D.C.: National Park Service, 2005.
- The National Trust. *The National Trust Manual of Housekeeping: The Care of Collections in Historic Houses Open to the Public*. London: Butterworth Heinemann, 2005.
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Available on the web at:
http://www.mla.gov.uk/resources/assets//I/ipm_guide_pdf_6640.pdf.
- Raphael, Toby and Nancy Davis. *Exhibit Conservation Guidelines* (CD-ROM). Harpers Ferry, West Virginia: National Park Service, 1999.
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http://www.scottishmuseums.org.uk/information_services/factsheets_list/collections_care.asp
- Thomson, Garry. *The Museum Environment*. London: Butterworth Heinemann, 1986.

Appendix A

Appendix A.

**Klondike Gold Rush National Historical Park, Seattle Unit
Daily Observations Chart**

Data from the National Weather Service, Seattle Office: <http://www.wrh.noaa.gov/sew>

Date	Temp.	Humidity	Weather	Notes

Appendix B

Appendix B.

**Klondike Gold Rush National Historical Park, Seattle Unit
Museum Pest Monitoring Record**

Trap # _____

Location _____

Date	Numbers and Types of Pests in Trap; Other Comments

