

A Housekeeping Manual
for the
Wyoming State
Museums, Historic Sites and Parks

Prepared by
Mark Fenn and the staff of the



WYOMING STATE MUSEUM

100 YEARS OF HISTORY 1895-1995

*Division of Parks and Cultural Resources
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Forward

We are confident that this Manual will satisfy most of the needs of the Museums, Historic Sites and Parks within the Division of Parks and Cultural Resources, Wyoming Department of Commerce. The Manual covers all aspects relative to the curatorial care of collections often referred to as "preventative conservation," which is defined as doing everything possible for an artifact to prevent on-going deterioration and destruction by inherent problems of structure and material, people and the environment; in other words, stabilization.

There is growing awareness of the role which museums, historic sites and parks play in the educational and leisure activities of society and of the increasing pressures to provide a cost-effective and improved service, which calls for the greatest expertise from all who care for our state's heritage. This Manual will contribute to the achievement of this aim.

Dona Bachman
Director
Wyoming State Museum

Conservator's Note

Throughout this manual you will be referred to the "conservator" for additional information. While I am the chief conservator, this term should be regarded as including fellow conservators in the museum's documents, art and photographic sections as well as the rest of the collections staff.

This conservator will rely heavily on many colleagues, on written materials and on the Rocky Mountain Regional Conservation Center, in which the Wyoming State Museum holds membership on behalf of the entire Division of Parks and Cultural Resources.

Nor should "conservator" apply only to Wyoming State Museum staff. I am pleased to draw upon the knowledge and experience of our Historic Sites curatorial staff as well as staff from other museums, from the State Historic Preservation Office, the State Archives and the State Archaeologist's Office.

We are all in this together. Regardless of who answers the "conservator's phone," we will all do our best to answer questions and find solutions. I look forward to working with you.

Mark Fenn
Conservator
Wyoming State Museum

INTRODUCTION/STAFF RESOURCES

This manual presents operating policies and procedures necessary to maintain a standardized program of collections care for all properties within the system. Historic properties staff are encouraged to refer to this manual before performing housekeeping and basic cleaning of objects.

Our principal concern is the proper management of collections. You, as curator, have the initial contact with those collections are charged with the responsibility for implementing the following policies.

Since we all share the same concerns for the continued preservation of the materials which we hold in public trust, we are ready to assist you in any way possible. For any questions, suggestions or supply requests please contact:

Jennifer Alexander, Supervisor of Collections, 307-777-5427

Dominique Schultes, Museum System Registrar, 307-777-5426

For Emergencies or disasters after normal working hours or weekends, please contact:

Jennifer Alexander, Supervisor of Collections, 307-634-8506 (home)

Dominique Schultes, Museum System Registrar, 307-634-8506 (home)

Section I:

Environment

Inspection

General Handling

Procedures

Exhibiting Objects

Storing Objects

Photographing Objects

SECTION I

ENVIRONMENT

No object is immune to the effects of the environment around it, and even the best conservation treatment cannot completely reverse damage caused by poor environmental conditions. It is much too expensive and time consuming to try to individually treat every object in the collections of the State of Wyoming, and it makes no sense to treat any object which will simply be returned to a damaging environment.

It is therefore of primary importance that we do all that we can to provide safe surroundings for all our collections; on exhibit, in storage and in transit. Presently, few if any of the museum facilities approach ideal environmental conditions for housing all collections safely, but in almost all cases there are improvements which can be made relatively easily. Of all environmental factors, relative humidity, temperature and light have the potential to cause the most damage.

RELATIVE HUMIDITY (RH), which is expressed as a percentage, is the amount of moisture actually in the air compared to the maximum amount of moisture the air could hold at that temperature. The warmer the air is, the more moisture it can hold. As air cools, its ability to retain moisture declines and as a result, water vapor condenses on cooler surfaces, such as glass or metal.

High humidity will cause many materials, such as wood, paper, textiles, leather, rawhide, bone, horn and hides, to absorb moisture from the air and swell, which in turn leads to warping, cracking, splitting and delamination. It also encourages mold growth, metal corrosion, and the migration of soluble salts in stone and ceramics. When the humidity decreases, materials release moisture, resulting in shrinking, cracking, delamination, embrittlement and desiccation.

Some materials, especially metals, are more stable at very low RH, while most others, such as wood, paper, photographs, textiles, and ethnographic material should be housed at a more moderate relative humidity.

TEMPERATURE The chief importance of temperature lies in its effect on relative humidity. In addition, high temperatures accelerate the chemical reactions responsible for the deterioration of objects, causing drying, color changes, and aging. Some materials soften and lose their shape if they get too hot. Very low temperatures can cause damage through the formation of ice crystals within an object when it freezes.

An environment which is acceptable to most materials is

around 40 percent RH (plus or minus 5%) and 68 degrees Fahrenheit (plus or minus 5 degrees).

More important than the exact temperature or RH is the stability of these conditions. Stability is important because rapid fluctuations, even within these parameters, can cause expansion and contraction of objects which can result in damage. Reducing daily fluctuations to a minimum and slowing and moderating seasonal changes will help control one of the least obvious, but most damaging problems for all museum objects.

The following chart indicates some of the effects of RH and temperature on various materials.

<u>Material</u>	<u>Low RH</u>	<u>High RH</u>	<u>Temperature Extremes</u>
Paper	embrittlement adhesive failure	mold distortion reaction w/grime	high temp. can dis- color and weaken
Photos	adhesive failure embrittlement curling	mold fiber swelling	high temp. can dis- color and weaken
Textiles	embrittlement	fiber swelling mold reaction w/grime	high temp. can dis- color and weaken
Wood	shrinking loosening of joints, veneer, moldings, and hardware checking, splitting	finish bloom swelling adhesive softening veneer lifting mold growth	
Leather	embrittlement color changes	mold growth swelling	high temp. weakens structure
Paintings	embrittlement discoloration checking, splitting delamination (separation of layers)	canvas sagging, swelling, mold, cracking, cleavage, bloom	high temp. weakens
Metals		corrosion	
<u>Alternating High and Low RH</u>			
Ceramics	salt efflorescence (eruption), spalling (scaling)		cracking from rapid fluctuations
Stone	salt efflorescence, spalling		cracking from rapid fluctuations
Glass	Crizzling (fine cracks), weeping (droplets accumulating on surface)		cracking from rapid fluctuations

PRACTICAL SUGGESTIONS FOR DEALING WITH HUMIDITY AND TEMPERATURE FLUCTUATIONS

The following suggestions will help to minimize damage caused by fluctuating humidity and temperature:

1. Avoid placing objects in damp areas such as leaky basements, near outside doors or near windows lacking weather stripping, or near leaky plumbing.
2. Avoid placing objects in excessively dry areas such as attics, near heater ducts, functioning fireplaces and/or wood burning stoves.
3. Keep doors and windows closed, close fireplace dampers and seal cracks and holes to help slow changes in temperature and humidity.
4. Monitor the environment with dial hygrometers and thermometers or recording hygrothermographs.
5. Use portable dehumidifiers, humidifiers, air conditioners and heaters as required to help stabilize relative humidity and temperature. During humid weather use fans to move air in stagnant areas to prevent mold growth. Always take special precautions not to place any of the above portable units too near artifacts; a minimum of eight to ten feet is recommended.
6. Create a special storage room if the space is available and if access to humidifiers or dehumidifiers is limited. Especially sensitive materials can be placed there when the general environment within the rest of the building becomes too damaging.

LIGHT is a form of radiant energy. It causes chemical reactions which degrade artifacts. All types of light cause damage, but ultraviolet (UV), present in very high amounts in sunlight and some fluorescent lighting, is especially harmful to many materials. Light causes bleaching or discoloration of surfaces, fading of wood and dyes on paper and textiles, feathers and many other objects as well as embrittlement and weakening of many materials. Damage caused by light is irreversible; it can't be reversed or "healed." Light damage is also cumulative; the total light damage is the product of the light intensity multiplied by the time of exposure. High light levels for a short period degrade materials as much as low levels over a long period. Light damage can be compounded by high humidity and/or air pollutants, including dust.

Sunlight, whether direct or indirect, is very high in UV and very damaging to many objects. It should be eliminated if at all possible. Where this is not possible it should be reduced to a minimum. Some things which can be done to reduce the harmful effects of sunlight are:

- Pull shades and/or draw drapes to reduce the amount of sunlight coming in.
- Move objects out of direct sunlight (indirect sunlight can

- also cause damage).
- Place sheets of UF-3 ultraviolet-blocking plexiglas in windows. These can be retrofitted with glazer's points or other fasteners. Please check with Historic Properties Supervisor.
 - Attach UV filtering film over windows. These films have a limited life and must be replaced periodically. See the literature or ask the manufacturer for details. Again, please check with the Historic Properties Supervisor before installing this material on historic windows.

Fluorescent light: Many standard fluorescent tubes are high in UV radiation and have a bluish or cool color. For color-balanced and UV-free lightbulbs and tubes, see Appendix I Materials and Supplies (p. 49-50). UV-filtering sleeves can be slipped over regular fluorescent tubes to filter out UV. These sleeves should be replaced every three or four years or as recommended by the manufacturer. See Appendix I.

Incandescent light: This type of light source (the common light bulb) produces relatively little UV, but can generate excessive heat, so care must be exercised to avoid placement too close to artifacts. Lower wattages produce less heat. Incandescent light will usually have a color distortion towards warm tones.

No matter what type of light is used, the exposure time and intensity should be limited to prolong the life of your objects. Maximum suggested limits are:

- for furniture (not upholstered), paintings and other painted surfaces, wooden tools, and most other materials: 150 lux (=15 foot candles)
- for colored textiles, watercolors, color photographs and paper objects, dyed feather or quill work and any other dyed object: 50 lux (=5 foot candles)

Unpainted stone, metals and ceramics are not effected by light.

To measure light levels contact Cheyenne to borrow the Colorado-Wyoming Association of Museums Environmental Monitoring Kit, or if a photographic light meter such as a Luna Pro is available, use it. Hold the light meter close to the object or area of concern with the light sensitive window pointing away from the object and toward the source of light. The reading on the meter can be converted to lux by using the table on the back of the meter.

You can also use the built-in light meter of a good quality 35 mm camera to get an approximate light reading.

- Place a 30 cm X 40 cm (12"X 16") piece of white cardboard

where you want to measure the light level, at the same angle as the artifact.

- Set the camera's ASA/ISO setting at 800 and the shutter speed at 1/60 second. Where applicable, switch the exposure meter so it measures over the entire field of view.
- Aim and move the camera until it is close enough that the field of view is filled by the white cardboard. Don't cast a shadow on the cardboard; this will cause an artificially low reading.
- Adjust the aperture (f stop) till the light meter indicates a correct exposure.

The approximate light level at the cardboard surface can be read from the following table:

f 4	= 50 lux (=5 foot candles)
f 5.6	= 100 lux (=10 foot candles)
f 8	= 200 lux (=20 foot candles)
f 11	= 400 lux (=40 foot candles)
f 16	= 800 lux (=80 foot candles)

Note that these readings are only approximate. The camera should be checked initially against a light meter to insure that the readings follow the above table. Whenever possible use a more accurate instrument.

Lowering light levels sometimes leads to complaints about poor visibility. This is often due not to the lighting of the displays and objects but to the contrast between the low light levels in the exhibits and excessively bright lighting near windows and doors and elsewhere in the galleries. This can usually be corrected by lowering the overall illumination, eliminating bright spots and arranging the entrance to allow time for visitors' eyes to adjust to the lower, and safer, light levels. A sign explaining the need for lower light levels to preserve the collections can also help foster public understanding.

PESTS can cause enormous damage to many different types of museum objects.

Insects can be responsible for the destruction of all sorts of organic materials.

Wood-destroying beetles attack furniture, wooden artifacts, structural timbers, woodwork and floor boards. Infestation may occur at any stage, from the live tree to a finished object. Dark-colored exit holes show that insects were present, but do

not necessarily indicate recent activity. Light-colored holes and frass (sawdust-like powder) indicate recent or ongoing activity.

To identify fresh insect activity in furniture and other wooden objects, place the object on a clean piece of dark paper. If within a few days fresh deposits of frass appear on the paper, the object is infested. Isolate any infested object, sealing it in a plastic bag if possible, and notify the conservator immediately. If not checked at an early stage, an infested object can fall apart, riddled with insect channels filled with frass, and the insects can move on to other objects in the collection.

Termites nest underground; wood-to-ground contact usually must exist for infestation to occur. Termites consume wood along the grain. They hollow out the wooden structure, leaving behind mud and frass beneath a thin surface layer of wood.

The main enemies of textile fibers are **carpet beetles** and **clothes moths**. In the larval stage, carpet beetles will feed on anything containing or made of protein (silk, wool, feathers, quills, hair, fur, horsehair, horn, rawhide and leather). They also feed on the carcasses of insects and other animals. The adult beetles feed on pollen, and therefore their most common means of introduction into houses and museums is on flowers. The larvae emerge from small tubular cases which are covered with short bristles and split up one side.

Clothes moths consume wool and other proteinaceous materials and are active only in darkness. As with the carpet beetle, the larvae do most of the damage. They leave small silken cocoons which can often be found in infested material.

Silverfish are the major threat to paper and photographic material. They are attracted by conditions of poor housekeeping such as "dirt" and by food containing starch and cellulose. They also thrive around moisture and mold. Silverfish will consume the surface of a photograph, including the emulsion. They also eat completely through paper, but may avoid inked areas. **Cockroaches** will also damage paper artifacts kept in dirty conditions that attract this type of insect.

Insect excrement is acidic and will damage inorganic material. **Flying insects and spiders** are the primary perpetrators. These "fly specks" are commonly seen as small black, brown or white spots on walls, shelves, paintings, and other objects.

Insect infestations can be very difficult to eliminate. Most insecticides and fumigants are hazardous to people, collection objects, or both, and are not recommended for use in museums. Prevention is therefore especially important.

Collections must be monitored for signs of the presence of insects. Glue board insect traps (fold up cardboard tubes with a very sticky coating on the floor of the inside) should be set in inconspicuous places against walls, cases or cabinets in exhibit and storage areas and checked regularly to see if any harmful insects are being trapped. Traps will not eliminate an infestation but can alert you to a problem. Check windowsills and floor sweepings regularly for dead insects.

In addition to frequent inspection, a program of scrupulous cleaning is necessary. The use of screens and closed doors is encouraged. Stored wood, grain and food items will attract a variety of insects and are discouraged in the museum. The best way to avoid infestation is to avoid using these materials for display. If interpretation depends on their presence, use plastic foods in exhibits. Clutter, dust and dirt should not be allowed to accumulate, and storage areas should be kept clean at all times. Eating and drinking should be prohibited in buildings containing collections, especially in storage areas. Staff members should eat only in a designated staff room, located as far from collections as possible. All garbage receptacles containing food scraps or residues should be emptied and removed from the building daily. All materials entering the building should be checked for insects and rodents. This includes new items for the collection, items being returned after a loan, and all equipment, supplies and packing materials.

If you suspect that you have an insect infestation:

- 1) Contact the conservator.
- 2) Isolate the infested object from other objects. If possible, seal the suspected object in a plastic bag.
- 3) Check other nearby pieces for signs of infestation. Look for damage, droppings, frass, shed skins or cocoons, live insects or eggs.
- 4) If you find any of the insects, cocoons or shed skins, place them in a jar or film canister, write on the container exactly where and when they were found, and contact the conservator for instructions and possible identification.

If the conservator feels that eradication of the insects can be carried out by site personnel, instructions for this process will be given. If not, the conservator will undertake the treatment.

Other Creatures Rodents are very destructive; their gnawing and tearing can cause considerable damage in a very short time. The corrosive nature of their excrement compounds the problem. Most may be kept out by plugging up holes and adding screens. Mouse and rat traps can help eliminate any which do get inside. Do not use poison because it often does not kill them until after they have reached the shelter of their holes. Decomposing rodents not only stink, they also provide food for carpet beetles

and clothes moths.

The droppings or carcasses of birds and bats occasionally cause problems, but these can usually be eliminated by screening the entrances they use.

MOLD AND MILDEW are caused by cellulose-digesting fungi. They feed on the cellulose found in plant fibers such as cotton, linen and paper, and on wood, breaking it down, weakening it, and often causing staining. Although not common, micro-organisms have been known to attack wool also.

The spores of these fungi are almost always present and are only waiting for a dark, warm, moist, stagnant environment in which to develop and thrive. Of these environmental factors, high humidity is the most important.

To prevent mildew damage, keep the relative humidity below 55%. Dehumidifiers and heaters can be used to reduce the humidity in closed spaces. Whenever this is not possible, use fans to keep the air circulating. Do not store objects in chronically damp places.

Always wear rubber gloves and a respirator when handling moldy material to avoid allergic reactions.

AIR POLLUTION AND AIRBORNE PARTICULATES are harmful factors not normally considered when one thinks of the Wyoming environment. However, air pollutants are present even in relatively small cities, towns, and rural areas.

When airborne pollutants such as dust, carbon dioxide, sulfur dioxide, hydrogen sulfide, nitrous oxide, smoke and soot, acids, alkalies and salts come in contact with an object, chemical reactions take place. In the presence of humidity, oxygen and light, numerous damaging compounds form. These airborne pollutants will darken pigments, discolor surfaces, accelerate tarnish and corrosion of metals, degrade paint and other finishes and make paper and textiles brittle. These substances can be carried by air currents to every portion of a storage or exhibition area.

Paper, textiles and other materials will act like sponges and absorb airborne materials with which they come in contact. For this reason insecticides, paints, solvents, lacquers, polishes, air fresheners and any other materials in aerosol cans should be kept away from artifacts.

Dust and surface dirt are composed of fine particles that are difficult to observe without a microscope. They are deposited wherever air currents pass; through galleries, through storage drawers, between frames and the objects in them. Dust not only obscures surfaces upon which it settles, but also causes

damage. It is abrasive, acidic and hygroscopic; so it scratches, corrodes and holds humidity, which in turn speeds corrosion and encourages mold growth. If airborne deposits are greasy, such as from cooking, they will attract insects, rodents and mold.

It is virtually impossible to eliminate all airborne particulates and pollution from the environment, but clean exhibition and storage areas and proper storage containers are the best protection against contamination by airborne pollutants. Keep all collections material as clean as possible. (See specific materials sections for appropriate cleaning techniques and materials.) Dust and vacuum thoroughly and frequently.

Keep windows and doors closed and screened. Use filtered ventilation systems if at all possible. Clean or change ventilation system filters frequently.

INSPECTION

Careful periodic inspection is an essential part of caring for any collection. If the guidelines relating to environment, handling, exhibition, storage and cleaning are followed, then periodic inspection is all that remains to insure proper maintenance.

At least once a week it is necessary to do a "walk-through" to check the storage and exhibit areas. Problems to look for are: water leakage from pipes or ceilings; condensation on walls, windows, pipes, objects or other surfaces; mildew, insect and pest damage, infestation and nests; dust and dirt; excessively high light levels; changes in the condition (shape, color, finish or surface details) of the objects in the collection. Check the thermometers and hygrometers and record the date, time and readings in a notebook. This notebook can be useful to maintenance people, the Historic Properties Supervisor, conservation staff and others.

GENERAL HANDLING PROCEDURES

Any time an object is handled the chance of damage increases. The damage may be catastrophic breakage or only a subtle degradation unnoticed by the handler, but every bit of damage reduces the longevity of the object to some degree. Many collection pieces have components which have reached or exceeded their life expectancies. Many have been improperly treated or stored in the past and are weak or brittle. Very few are as sturdy as they were when new. Therefore, the number of people allowed to handle collections should be limited. These individuals should be thoroughly trained in proper handling methods. And objects should be handled only when absolutely necessary. Casual visitors should never be allowed to handle artifacts, and neither guides nor other personnel should do so in their presence. Researchers should be instructed in proper handling techniques, supplied with white cotton gloves and supervised while handling collection objects.

Gloves

White cotton gloves should generally be worn when handling objects to avoid leaving stains, finger prints, skin oils and salts. It is especially important to wear gloves when handling any metal object or part of an object, since salt and other secretions in skin oil cause corrosion. This is much easier to prevent, by wearing gloves, than to remove after it has occurred. The only time gloves should not be worn is when handling very smooth, heavy objects where gloves increase the chance of dropping the object or very fragile flaking materials which could snag on the fibers of the gloves. In these cases wash your hands just before handling, and as they become soiled.

Gloves should be clean. As soon as they begin to show signs of becoming soiled, exchange them for a clean pair. Depending on the condition of the objects being handled, the frequency of replacement could be several times a day. Soiled white cotton gloves should be laundered with a mild laundry detergent (don't use scented laundry or dryer sheets) before they are reused.

Do wear gloves when handling:

paper	books and albums
photographs	framed objects
paintings	painted wood or metal
unglazed ceramics	stone (unpolished)
horn, antler, bone, ivory	leather
jewelry	metal objects
furs	taxidermy specimens
textiles	tools
wooden objects	vehicles
guns and edged weapons	

Do not wear gloves when handling:

glass, glazed ceramics

heavy, slick furniture

Disposable plastic gloves should be worn when handling hazardous materials. These may include leaking chemical containers and/or items found wrapped with insecticides. Many older natural history specimens such as mounted animal heads, birds and hides were treated with toxic chemicals as part of their preservation. Disposable plastic gloves should be worn when handling these. Please consult the conservator if items such as these are encountered.

When an object is to be examined, first provide a clean, flat, padded work space. Assemble the necessary equipment for examination, such as a magnifying glass, pencils, paper, auxiliary lighting, etc.

Before moving the object, plan the route to be taken. Make sure pathways are clear and there will be a place to put the object once your destination is reached.

When it is necessary to pick up or move an object, examine it carefully first, looking for weakened structural areas, such as tears, cracks, breaks, friable or flaking materials, or old repairs. These areas should be fully supported when handling. Check to see if the object has removable components (lids, funnels, drawers, chair seats, etc.) and place these smaller pieces aside in a safe place. Reunite these parts as soon as the move is completed. Never lift an object by its handles. Always use both hands to support an object. Clean hands or white cotton gloves (see list above) are essential when handling collection material; dirt, acids, oils, and salts from hands can cause corrosion or stains.

To move large items, such as furniture, at least two people are required. For anything larger than a small side chair, use at least two people. If no help is available, wait. Never push a piece of furniture across the floor. Before lifting, make sure that the parts which will be grasped are well attached to the rest of the object. Don't bend your back; instead, squat, keeping your back straight and upright. Lift with your legs. When lifting a chair, grasp it by the sides of the seat. Don't wear white cotton gloves when moving very heavy, smoothly finished furniture; they will reduce your grip and may even cause your hands to slip. Instead, be sure your hands are clean before touching the object. A four-wheeled cart is excellent for moving heavy objects around inside a building or to a loading dock. Pad furniture with movers' blankets to absorb shocks and avoid abrasion.

Marble table tops can be transported on a cart, but make sure they are well padded. Even the slightest shock may crack

them. Support them well and keep them vertical. If they are carried, carry them vertically, like a piece of glass, never horizontally, as their weight can cause them to crack.

Before moving a framed object hanging on a wall, inspect its manner of attachment. Also check the frame closely because the joints are often weak. Sometimes the gilded plaster surface decoration of very ornate frames is loose, or poorly attached. If the frame is solid, grasp it firmly at the center of the bottom and along one side. Two people may be required for a large object. Lift it upwards until it is free.

When carrying a framed object, hold it upright with the design facing toward you, grasping the frame firmly in the center of the bottom and midway up one side. Never carry it by its hanging wire. Avoid touching the front or back of a painting. This causes stress to the paint structure and may lead to cracking or cleavage.

To review and expand upon the above guidelines, the following suggestions are provided:

1. Handle objects only when necessary.
2. Move objects one at a time.
3. Have your plan well thought out before moving an object.
4. Before moving, make sure there will be a secure padded surface upon which to set the object.
5. Use both hands to support the object.
6. Carry sheet glass, mirrors, marble tops and framed items vertically.
7. Avoid placing objects where they may be easily bumped.
8. Make sure that objects are stable and will not fall over or roll off a table after you set them down.
9. Always use a stable ladder or step stool and work with a partner when moving objects stored in high places.
10. Avoid stacking objects on top of each other. If you must, due to space limitations, use common sense and place lighter, more fragile objects on top of heavier, sturdier ones.
11. Never push an object along the floor or table top.
12. Always have help when moving heavy objects. Use a cart if necessary.
13. When lifting heavy items do the following:
 - a. Bend at the knees.
 - b. Keep back straight.
 - c. Lift with your legs.
 - d. Avoid twisting motions. Instead, pivot on your feet.
 - e. When setting an item down again, keep back straight and bend at the knees, not at the waist.
14. To lift a chair, grasp it at the sides of the seat.
15. Never assume that an object or any of its parts are

- in stable condition. Inspect everything before lifting.
16. Always pick up an object by a stable area where you will have a secure grip. Do not lift objects by their handles.
 17. Support fragile objects from beneath with hands, cardboard, plywood, etc.
 18. When moving a framed object, support it from the bottom with one hand, and steady it with the other hand on the side. (Do not lift frames by the hanging wire or decorative appendages.) If the framed object is small enough for one person to carry, position the piece so that the art surface is toward, but not against, your body. For large framed objects always use two people.
 19. Avoid working or placing objects near heating and air conditioning ducts. Also avoid having lights nearby which could scorch surfaces.
 20. Avoid wearing jewelry, it can snag textiles and scratch finished surfaces.
 21. Always work on a padded counter top or table to reduce the chances of breaking objects which may be accidentally dropped or knocked over.
 22. Always be alert and pay attention to the work at hand. If excessively tired or on medication, please do not work with artifacts.

SPECIAL PRECAUTIONS

Metal objects

1. Always wear clean cotton gloves when handling metals.
2. Watch for abnormal corrosion (odd-colored material that isn't a "normal rust" or patina.) Contact the conservator if noted.

Paper objects (art, prints, advertisements, newspapers, commercial products, photographs, etc.)

1. Never pick up by a corner.
2. Never bend.
3. Watch for tears and loose backing boards.
4. Always support unframed works from underneath with a piece of clean matboard or a file folder.

Leather

1. Always support from underneath.
2. Do not attempt to unfold creases.
3. Avoid folding or bending.

Textiles

1. Never pick up by a corner.
2. Avoid folding more than necessary. Pad folds with acid-free tissue.
3. Always be aware of the possibility of snagging.
4. Some hats, gloves, and shoes may require stuffing with

- acid-free tissue paper from inside and underneath to maintain shape during handling, exhibit and/or storage.
5. Provide solid support (such as foam core or cardboard) under small textiles when moving.

Glass and ceramics

1. Always support from underneath. Never pick up by edges or handles.
2. Watch for hidden breaks or cracks.

Books

1. Support with both hands when opening.
2. Never open a book more than 180 degrees (less is better.)

Edged Weapons

1. Always wear cotton gloves when handling metal parts.
2. Treat all blades as if they were extremely sharp.
3. Never flex a blade.

Firearms

1. Always wear cotton gloves when handling metal parts.
2. Do not work mechanisms.
3. Do not point at anyone.
4. Be sure firearms and explosives are disarmed. If you are uncertain, contact the Historic Properties Supervisor or the conservator.

MOVING OBJECTS

The handling or transporting of collections to new locations requires not only great care, but proper paper work. One of our responsibilities is to leave a paper trail so that anyone can locate an object. Do not assume you'll always be available- write it down.

If an object is to leave the site, contact the appropriate museum curator or the museum registrar at (307) 777-5966 or (307) 634-0613. If there are questions concerning moving techniques for specific objects call the conservator. If the object move is long-term or permanent, notify the registrar so that the inventory and object location can be updated.

Packing and transporting: Boxes generally provide a safe way of transporting objects. It is important to use plenty of padding or packing material. Bubble wrap, styrofoam pellets and even crumpled, unprinted, newsprint make good packing materials (don't use newspapers, the ink rubs off onto objects very easily). Padding should prevent any movement of the object which could

lead to damage, including rubbing, bumping against other objects or vibration as well as providing protection against impact from sliding, dropping, etc. The size and structure of the box must be appropriate to the contents. For example, heavy objects may not be sufficiently protected in a cardboard box which would give ample protection to lighter objects.

Also, be aware that objects can undergo physical shock if exposed to extreme temperature and humidity variations. When transporting objects during the winter, always cover them with a few blankets, even if only traveling a short distance. Cover each object when taking it out of the building and make sure the interior of the vehicle has already been warmed. After unloading, leave the blankets on a least an hour or two, preferably overnight. This allows the object to adjust to the new environment without suffering thermal shock.

Care should also be exercised in the summer. Do not load objects into a vehicle that has been sitting in hot sunlight for any length of time. It is best to park in the shade or run the vehicles's air conditioner so it reaches an equilibrium with the environment from which the object came.

EXHIBITING OBJECTS

The safety and security of the objects must be carefully considered when planning an exhibit. No nails, screws, pins, tacks, staples, tape, glue or wax should ever be used directly on any artifact. Mounts must be planned to provide support for fragile objects without straining them. Mounts must be made of inert materials and be easily removable, not permanently attached to the objects. Adequate padding must be included to prevent the mount from marking the object. A sheet of Mylar D plastic (polyester) film should be placed under any object which rests on furniture, wooden shelving or any other surface which may be scratched or give off harmful fumes.

Framed objects must have a window mat or other spacer to maintain an air space between the object and the glass.

STORING OBJECTS

Suitable storage space is almost always limited, and often objects are relegated to otherwise unusable areas such as attics, basements and closets. Once there, the objects are often left for long periods. It is therefore just as important to maintain proper conditions in storage spaces as it is in exhibit areas.

A storage facility must be secure from theft and vandalism. It should not be accessible to visitors. It should be dark,

except when actually occupied. It must be insect-free and unaccessible to insects, rodents or other pests. If at all possible there should not be any overhead pipes which could leak and damage objects, and it must not be subject to flooding. The temperature and relative humidity should be moderate and controllable.

Objects should not be stored directly on the floor, in case of flooding. Shelves, drawers or cabinets should be used for smaller objects. Larger objects can be placed on pallets or blocks. Any wood which contains or comes into contact with collection objects, such as shelving, cases, etc. must be sealed with a two part epoxy or moisture curing polyurethane paint to reduce the release of natural wood acids which damage collection objects. The conservator can advise you on this. There must be sufficient clearance under shelves, pallets and blocks to permit easy and efficient cleaning.

Objects should be protected from dust. Furniture and other large objects should have dust covers of prewashed, unbleached muslin which should be laundered regularly. Smaller objects can be stored in well sealed cabinets or in acid-free boxes. In either case they must not be crowded. Packing too many objects into too small a space increases the chances of bumping, knocking, rubbing and other damage when objects are being removed from or returned to storage. Dust covers of acid-free tissue may be made for small objects. Polyethylene bags can be used as well, provided they are either not completely sealed or have holes punched in them, to avoid the danger of condensation. Very small objects can be housed in individual clear, hard plastic (polystyrene) boxes. Using these, the objects can be viewed without being handled, and a number may be packed into a drawer, shelf or larger box without crushing any.

Labeling shelves and keeping inventory lists reduces the amount of handling needed to find an object. Shelves should be padded with 1/8" ethafoam (see Appendix I Materials and Supplies, p. 49-50, for a list of suppliers) and have a short lip around the edge to keep objects from being accidentally knocked off.

Fragile objects may need acid-free tissue or ethafoam padding or specially made mounts of acid-free matboard, plexiglas, unbleached cotton fabric, or other inert materials to support parts which cannot support themselves. These mounts must be easily removable and should never be permanently attached. As in exhibiting, never use nails, screws, pins, tacks, staples, tape glue or wax directly on collection objects.

PHOTOGRAPHING OBJECTS

Care must be taken while photographing collections to see that no harm is done. The heat produced by photographic lights can damage artifacts. Lights should be evenly spaced and far enough away from the object so that there is minimum heat. Lights with photographic umbrellas attached aid in reflecting heat away from the object being photographed. Objects can undergo thermal shock if they are brought directly from cool storage areas to a hot photographic set-up. Heat can cause drying and shrinking of organic materials, discoloration, and even scorching.

Since few facilities currently possess complete photographic equipment, photography set-ups will probably be makeshift but that does not excuse us from careful planning. Clear an adequate area. If a table or easel is required, see that it is secure enough to hold the objects to be photographed. Flat objects should be photographed on an easel or table, on the floor or on a copy stand, or hanging on the wall, if they are framed and have appropriate hanging hardware. Small three-dimensional objects can be photographed on a table. Larger pieces, especially furniture, should be photographed where they stand.

Section II:

Care & Cleaning of Objects

SECTION II

CARE AND CLEANING OF OBJECTS

In this section specific instructions are given for the care and cleaning of various types of materials most commonly found in collections.

METAL

When examining or maintaining metal artifacts, all work surfaces and storage boxes should be well padded to avoid dents, scratches and abrasions. Always wear clean cotton gloves when handling any metal object. Keep metal artifacts clean (see following section on cleaning metals). Dirt, dust, and grime scratch metal and induce corrosion. Do not use adhesive tape or other adhesives to secure the lids of metal pieces. They leave a residue that is damaging. Never attempt to remove dents.

Cleaning removes dust, grime, grease and other foreign material. It does not polish. The following steps are safe for many metal artifacts, except where noted.

To remove dust: Use a soft dry paint brush. Be careful not to scratch the object with the metal ferrule of the brush. The best type of brush is natural sable.

To remove grime, grease, etc.: Never use water to clean any metal artifact or part. Ethyl alcohol on a clean cloth or cotton swab will safely remove most types of grimy accumulations from metal artifacts. Mineral spirits may be substituted.

Do not clean polychromed (painted), inlaid, or coated (lacquered) metal artifacts with alcohol; it may damage these coatings. For instructions in cleaning these artifacts, contact the conservator.

Lubrication: To lubricate moving parts such as hinges, apply a small amount of paste wax to the area of friction. A small amount of mineral spirits can be added to help carry the wax into a tight fitting or frozen mechanism. Wipe off excess.

Polishing: Every time a metal artifact is polished, a small amount of the metal is removed. For this reason polishing is not recommended and regular polishing is strongly discouraged. Brass, bronze, copper and pewter should never be polished because this prevents the formation of a protective patina. If polishing seems unavoidable, please contact the conservator to discuss appropriate techniques and materials.

Never polish any of the following:

Iron (blued or otherwise)
Gold

Ormolu (gilded bronze)
Lead

Zinc
Hardware on furniture
Painted or patinated metal

Niello
Plated objects
Composite artifacts (made from
metal and another material,
such as a metal box inlaid
with ivory)

Do not attempt to remove heavy rust from iron objects, either mechanically or with commercial rust removers. This job should be referred to the conservator.

CERAMICS

Most damage to ceramics is caused by human error, usually occurring when the object is handled for cleaning or movement.

Inspect the object for repairs or weak points before picking it up. Never pick up a ceramic artifact by its handle, spout or other appendage. Always support it from underneath with both hands and wear clean white cotton gloves on unglazed ceramics. Do not wear gloves when handling glazed ceramics, as the slippery surface could cause you to lose your grip. Always make certain your path is clear and you have a clear padded surface to set the object on before moving it.

Handling for inspection of an object to verify its marking, signature or hallmark, generally located on its bottom, can often be eliminated with a photocopy machine. A reproduction can be kept with the object's file, plus a second copy could be displayed with the object to serve as quick identification.

Many additional problems can be encountered with Native American and other ethnographic pottery, including flaking decoration. In the case of excavated pieces it is recommended that the conservator be consulted before any extensive cleaning is done, especially if the surface is powdery or flaking.

Never wet unglazed surfaces, repairs, cracks or broken edges.

Cleaning: Ceramic objects should be periodically dusted with a soft dry brush. Dust is absorbent and will hold moisture on the ceramic surface. Grime creates a good environment for mold, which secretes enzymes that stain, discolor or damage glazed and unglazed surfaces.

Washing should not be a part of routine cleaning. It should only be done in the case of extremely dirty glazed objects. Do not wash ceramic objects which have repairs; the adhesive may be water soluble and could fall apart in water.

Before beginning to wash a glazed object, cover the bottom of a sink or a tub with a thick, clean towel; or use a plastic tub as a wash basin. Pad a nearby table with a thick clean towel

to receive the washed objects. Use only warm water, not hot, which can crack the glaze. Do not add detergent, soap or any other cleaning agent to the water; and never use an abrasive powder, abrasive pad, or metal cleaning device.

Do not wash more than one artifact at a time. Soak each piece for two to three minutes or less. When the piece is clean, rinse thoroughly under warm tap water. A lint-free cotton cloth is best for drying.

Occasionally stains or dirt accumulate in crazed glaze, causing a brown discoloration. If the stain cannot be removed by routine washing, do not use detergents or bleaches. Harsh solutions may cause further pitting or crazing. Stains such as these should be brought to the attention of the conservator.

If any metal is attached to the piece, or it is gilded, do not attempt to wash or polish the metal components.

Breakage: In the event of breakage of ceramics or glass, the first reaction people usually have is to pick up the pieces and try to fit them together, as if it were a cardboard puzzle. This is the worst thing to do because fragile areas around a clean break can be abraded, making it impossible for subsequent repairs to be invisible. Instead, protect the broken pieces by carefully wrapping them individually to prevent further chipping of their edges. Store all the pieces together in one box. Save all fragments, no matter how small. If possible, do not touch the edges of freshly broken pieces because skin oils and salts interfere with adhesives used in repair.

Exhibit: Place a layer of cork, ethafoam or mylar D under ceramic objects exhibited on furniture or other finished surfaces. This will isolate them and protect the finish from harm. Thin cork sheets, used for making gaskets, can be purchased from hardware or auto supply stores. Trace and cut the cork in the shape of the base of the object, and simply place it underneath. Do not glue it to the bottom of the object.

GLASS

As with ceramics, glass objects suffer most often as a result of human error during handling, storage, and cleaning. Eliminate all unnecessary handling, including routine washing. Try to arrange storage so that dust does not settle on objects. Polyethylene bags can be used for this purpose. Remember, if the object isn't handled, the most common cause of damage is eliminated.

Wash glass on exhibit only when necessary. Dust as necessary to remove dulling film. Surface deterioration in the form of clouding or opalescence suggests a change in the stability of the artifact. These conditions should be called to

the attention of the conservator. Prolonged wetting, changes in relative humidity and sudden temperature changes can adversely affect glass.

Cleaning: Never wet any archaeological glass or glass which is flaking. Never attempt to clean a glass object which is in need of repair or has old repairs. Old glue joints may break, causing additional damage. These items should be cleaned by a conservator. If any metal is attached to the piece, or if it is gilded, do not attempt cleaning.

Before beginning to clean a glass object, cover the bottom of a sink or a tub with a thick, clean, towel; or use a plastic tub as a wash basin. Pad a nearby counter with a thick, clean, towel to receive the washed objects. Use only warm water, not hot. A little ammonia or dish washing liquid can be added (wear protective gloves when using ammonia). Never use an abrasive powder, abrasive pad, or metal cleaning device.

Soak each piece a short time and do not wash more than one artifact at a time. When the piece is clean, rinse thoroughly under warm tap water. A lint-free cotton cloth is best for drying.

STONE

Different kinds of stone have been used for sculpture, monuments and tools since earliest times. Extremely hard materials such as basalt and granite wear well but are difficult to carve. These very hard stones are also relatively difficult to disfigure. Softer marbles, alabasters, sandstones and limestones are popular, but tend to absorb grime and are easily scarred by abrasion. Always wear gloves when handling stone unless a firm grip is necessary.

Cleaning: Keep large stone objects free of dust by periodic cleaning with a vacuum and a brush attachment. Never use cloths. The rubbing action can push dirt into the pores, creating a shiny and discolored surface. Surfaces should always be brushed from top to bottom. No other cleaning or stain removal should be attempted because of the possibility of further staining.

BONE, IVORY, TOOTH, ANTLER AND HORN

Fluctuating relative humidity is the most frequent cause of deterioration of these objects. They are all hygroscopic, which means that they expand and contract by taking in or giving off moisture in response to changes in the humidity of the air around them. This flexing can result in cracks, splits and warping. When these materials are used as inlay in conjunction with wood veneers this flexing can cause the inlays to separate from the base to which they are attached.

Highly desirable patinas formed over many years can be destroyed in a short period of time by sunlight or unfiltered

fluorescent lighting or by inappropriate cleaning.

Cleaning: Wear clean white cotton gloves. Acid and oil from the hands can easily discolor these materials. To clean, use a soft dry brush or, if necessary, wipe with a cloth slightly dampened (never wet) with water and immediately wipe dry with a soft dry cloth.

LEATHER

Try to keep humidity around 40%-50%. Extremely low humidity causes shrinkage, embrittlement, and cracking; high humidity encourages mold growth. Keep leather artifacts in an environment where there is circulating air. Damp, still air will rapidly encourage mold growth on leather.

Leather items should never be stored or exhibited in direct sunlight, unfiltered fluorescent or strong incandescent light. Such exposure causes long term deterioration and fading. Examine leather objects for splitting, tearing, creasing and surface cracking. Report such conditions to the conservator. If an artifact has leather buttons, thongs, ties or straps, handle with extreme care since they are easily broken or torn.

Flexible hollow leather objects such as gloves, shoes and hats should be stuffed and padded with acid-free tissue to prevent unintended folds or crumpling. Never fold leather. Creases become set within a relatively short time and are often impossible to remove. Do not attempt to unfold pieces stiffened and creased from neglect and improper storage.

Never attach adhesive labels or tape to leather. Tapes can produce stains that are impossible to remove.

Leather maintenance depends on a knowledge of the different types of leather and their specific problems. The wrong remedies can cause irreparable damage.

Cleaning: Most leather artifacts are over-saturated with oils, waxes, greases, dressings and other commercial formulations from years or decades of dedicated but misguided care. The last thing they need is more dressings. It is natural and unavoidable for leather objects to become less flexible as they age, and in most cases, collection objects no longer need to be flexible. Therefore, do not apply saddle soap, waxes, greases, oils or other leather treatments to collection objects. Any apparent benefit from these products is at best temporary, and most cause undesirable changes in the leather as well as accelerating its deterioration.

Leather objects should never be cleaned with water. Instead, use a soft, dry brush or cloth or a vacuum. Gloss may often be restored by light buffing with a soft, dry, white flannel cloth. Any more extensive treatment should be referred

to the conservator.

FIREARMS

For care and cleaning of firearm exterior surfaces, please refer to both the wooden and metal object headings in this section. Do not attempt to reblue the metal parts of firearms.

Make sure your firearms and other explosive collection pieces have been checked for safety. To determine if a firearm is loaded, call your local police department or the conservator or follow these procedures:

For breech loading weapons check the chamber and remove any cartridges.

For muzzle loaders you will need a dowel longer than the barrel and smaller in diameter than the bore. Wear leather gloves and safety goggles. Make sure the weapon is not cocked. Place the weapon on a table pointed in the safest direction. Stand to the side of the weapon and gently insert the dowel into the muzzle until you meet resistance. Mark the dowel at the end of the barrel, then withdraw it. Place the dowel along the outside of the barrel with the mark corresponding to the end of the barrel. If the bottom of the dowel extends the full length of the barrel, the weapon is not loaded. If the measurement indicates that the dowel did not penetrate the entire length, the weapon could be loaded. In this case, flag the gun with a paper tag indicating this fact and contact the conservator. Place the weapon in a safe storage area.

FURNITURE AND OTHER WOODEN OBJECTS

Furniture was designed to be functional. It was used in a household and subjected to wear and abuse. Therefore, on a collection piece, dents, scratches, burns and stains are part of the object's history and should be preserved. By placing an object in our collections, we are arresting its destruction, therefore, today's abuses are not part of that history. As an historic object, it should be removed from daily functional use and protected from staff and visitor handling.

If damage occurs to furniture, report it directly to the conservator. You may be advised to undertake minor repairs yourself. However, it is important to obtain prior approval from the conservator and to document all repairs and the methods and materials used.

General Housekeeping: Poor housekeeping encourages damage from dust, pollution, rodents and insects. Periodic vacuuming and dusting are essential. The importance of routine dusting cannot be overemphasized. A soft cloth, the texture of a diaper,

makes an excellent dusting cloth. When it begins to darken with soil, switch to a clean one and wash the dirty one. Be careful not to snag loose parts when dusting veneered or inlaid surfaces.

Collect any bits that brush off, place them in labelled envelopes or zip lock-type bags and store them, in a drawer of the object if possible.

While sweeping, be careful not to brush furniture with the broom bristles. Do not wet mop near furniture. Repeated contact with abrasive bristles or wet strands will eventually remove a finish.

Cleaning: To clean furniture that has not been cleaned recently proceed as follows:

Vacuum the surface with a soft brush attachment. For peeled veneer or frayed upholstery, hold a piece of fiberglass or plastic window screen, with its ragged edges taped, between the object and the brush. This prevents bits of veneer or fabric from being sucked into the vacuum cleaner. Corners and elaborate carvings can be dusted with a soft hand brush.

If the surface is covered with a grime which the above steps do not clean sufficiently, or if you wish to remove wax buildup, please contact the conservator.

Do not clean marble tops with any solution. Cleaning solutions can actually increase staining by carrying the foreign matter deeper into the stone. If marble must be cleaned, contact the conservator. For routine dusting, use a fleece duster or a vacuum cleaner, not a cloth which may actually force dirt particles into the porous stone.

If the rest of an object looks its age, shouldn't its hardware look its age also? Normal patination (browning of the surface) forms a protective layer. Furniture hardware should be cleaned, but never polished.

Alcohol is a safe cleaning agent for most uncoated brass furniture hardware. While cleaning, if possible, slip a piece of mylar or aluminum foil behind the brass to protect the wood finish, but do not loosen or remove hardware. Wipe the brass with a cotton swab, damp, not wet, with alcohol. An alcohol cleaning will not polish, but will remove damaging greasy fingerprints and allow a protective brown patina to form. If the hardware has a coating or finish on it, do not use alcohol as the finish might be soluble in alcohol.

Do not polish furniture hardware. Polishing wears some metal away every time it is done, so repeated polishing actually destroys part of an historic object. Polish residue also accumulates in recesses, causing a hard, whitish discoloration which is disfiguring and difficult to remove. And polish can

damage the wood finish.

Do not use dip cleaners or copper brighteners. Some are acidic or contain chlorides, which cause a serious corrosion, nicknamed "bronze disease." For the same reason, do not use the traditional home recipes of vinegar (an acid) and salt (sodium chloride). Never use buffing wheels or steel wool.

Wax: Waxing furniture and wooden artifacts is not recommended. Wax can protect an earlier finish, but the wax on non-functional furniture in a museum is not being worn off by use, and so does not often need to be replaced. Frequent polishing is encouraged by furniture polish manufacturers to increase sales. Frequent applications of wax actually cause surfaces to attract dust and can soften the underlying finish. Furniture in a museum collection should not require polishing any more than once every five years or more.

Wax is not recommended as a finish on bare wood because once applied, it is difficult to remove. It should only be used as a protective coat over finishes of varnish, shellac, etc., and then only after consulting the conservator.

The drawers of furniture in the collection should not be used. Where this is unavoidable, paraffin wax (available from your local hardware or grocery store) can be used as a lubricant for the drawer runners. The wax will reduce friction, helping the drawer to slide with less force, and retard the wearing away of the wood.

Avoid liquid or aerosol products that promise to clean, wax and polish in one application. To liquify wax, chemicals are added which may attack finishes and cause their surfaces to become tacky. Some contents can permanently change a finish. The damage may not be apparent for some time, but can eventually result in major discoloration of the object.

Finishes: Refinishing or restoration is not generally appropriate for furniture or other wooden objects in museum collections. Refinishing frequently includes the stripping or removal of an early finish. This may be advocated by commercial restoration shops but violates ethical principles of museums because it is an unacceptable alteration of the object and destroys the historic and informational value of the piece.

Never use a recipe for "feeding" a finish: finishes do not have digestive systems and that type of "nourishment" may harm them. In a few years the feeding material will darken and someone may attempt to remove it. This may result in the destruction of the original finish below.

Feeding recipes found in books on furniture and weapon

restoration often prescribe linseed oil, which polymerizes as it dries to form a very tough, hard film which darkens with age. As the finish changes appearance from the effects of high temperature and low humidity, moisture is lost, causing a dry appearance. Oil, however, cannot replace this moisture. It will merely change the surface characteristics to make it appear handsome for a short while. Never apply anything containing linseed oil to a collection object.

FUNCTIONAL WOODEN OBJECTS are items whose main structural components are wood, including objects with moving parts such as spinning wheels, looms and carriages. They may also have parts of other materials including leather, metal, etc. This category also includes wooden objects with no moving parts such as kitchen utensils, farm implements and tools.

Use of functional objects should be avoided, since they may become worn, abraded, broken or stained. Every attempt should be made to use reproductions for demonstration. Help in obtaining reproductions/props is available through the Wyoming State Museum Collections Section.

Maintenance and Care: To properly care for functional wooden objects, refer to the above sections on furniture. Additionally, if the object is composed of movable wooden parts which are required to move, it may be advisable to lubricate them. However, avoid lubricating oils, since they will permanently stain; instead, use paraffin wax.

As with furniture, do not apply any finish to bare wood on these objects; apply wax only if the surface is clean, has an existing finish and is truly in need of waxing.

If you have any questions, please consult the conservator.

PAINTED WOODEN OBJECTS include objects such as polychromed (painted) wood sculpture, furniture, clock dials, carriages, etc. Secondary components may be composed of other materials.

Painted wooden objects are usually very complex in structure and are greatly affected by environmental changes. Every attempt should be made to exhibit and store these objects in a controlled environment. At the very minimum, they should be placed away from extreme humidity and temperature fluctuations. They should also be protected from handling by visitors. Their condition should be continually monitored and the conservator should be informed of any changes such as paint cleavage or flaking.

Maintenance and Care: Due to the complexities of painted wooden objects, please refer all questions to the conservator.

For general periodic cleaning of objects with stable paint

layers, dust only with a soft brush. Apply no moisture or commercial polish, wax, cleaner, etc.

TEXTILES

Most historic collections contain numerous artifacts that fall into the category of textiles, such as rugs, curtains, bed coverings, household linens, upholstery, clothing, flags, samplers and other types of needlework.

Textiles can be composed of many different fibers. The most common in historic collections are silk, wool, cotton and linen (flax), but you may also have rayon and other manmade fibers.

All textiles become fragile with age. This process is irreversible and is accelerated by improper environmental conditions. Thus, it is necessary to handle, exhibit and store textiles properly. Preventative care and maintenance are most important.

Light, whether natural or artificial, is extremely damaging to textiles. Silk, often weighted with metallic salts in the nineteenth century, is especially sensitive and will "shatter" (the fibers will break) with excessive light. Light damage is cumulative, irreversible and often takes place slowly, without being noticed until it is too late.

Ideally, all textiles should be kept in the dark, never to see the light of day. Of course this is not possible, but there are ways of minimizing the problem of exposure to light on exhibit. See pages 7-8 for suggestions.

Textiles should not be exposed to light levels higher than five foot candles or 50 lux. If you would like visible and UV light readings taken at your site, please contact the conservator.

The combined factors of relative humidity and temperature are crucial. High temperature and low humidity dry out and embrittle fibers until they powder away. Low temperature and high humidity encourage condensation, which can cause stains and color changes. High temperature and high humidity combined provide the perfect environment for mold growth and can also increase fading with exposure to light. Humidity fluctuations cause expansion and contraction of the textile fibers which results in abrasion and degradation of the fibers. For suggestions on how to control relative humidity and temperature, see page 7.

Air pollutants and dust easily damage textiles. When not kept to a minimum, dirt can become so embedded in the textile that it is impossible to remove. This embedded dirt will abrade

fibers during movement or handling of the textile. To eliminate dirt, keep windows and doors closed as much as possible. Change furnace filters frequently. Vacuum or damp mop floors rather than sweeping with a broom to avoid stirring up dust. This should be done on a regular schedule.

Insects cause serious damage and can be difficult to control. They can easily enter through windows, doors, or on the clothing of visitors. Good housekeeping is essential as insects seek dirt and crevices in which to breed. Keep areas clean and don't allow food or drink in areas where textiles are kept. Cover or repair exterior wall holes, set traps and keep windows and doors closed.

Exhibiting textiles: Only textiles that are in good, stable condition should be exhibited. Exhibition time should be no more than six months out of the year. Many collections, however, are not large enough for frequent changes or rotation, so protecting these textiles from light, heat, humidity extremes and air pollutants becomes extremely important. These steps will help:

1. Protect carpets and rugs from heavy furniture by placing the feet into plexiglas or glass cups.
2. Protect rugs and carpets from visitors with runners on walkways.
3. Avoid setting heavy objects on textiles, especially those with a pile such as velvets, furs, etc.
4. Do not place textiles on unfinished wood as the acids given off by the wood are harmful. Separate with a layer of mylar, de-sized muslin (washed several times in hot water) or acid-free tissue. If the wood is not part of the collection, it may be sealed with several coats of polyurethane varnish.
5. Do not place textiles directly on furniture that has been heavily oiled in the past. Place a layer of mylar between the wood and the textile.
6. Avoid sharp creases and corners. Pad with acid-free tissue or de-sized muslin.
7. Clothing that is not structurally sound (i.e. has tears, holes, incomplete weaves or seams) should not be exhibited, but if it is, it should be properly supported. Contact the conservator for advice.
8. Never hang clothing directly on wood or wire hangers. Rusty wire can stain and damage the fabric. In addition, all the weight of the clothing is concentrated on the small area in contact with the hanger, straining the fabric. Instead, make padded hangers. Apply several coats of moisture-curing polyurethane varnish to a sturdy wooden hanger. Pad it with cotton or polyester batting and cover with de-sized muslin.
9. If a mannequin is used, it is best to use one that is too small and pad it to fit, rather than forcing the

- clothing onto a larger mannequin.
10. The mannequin must be clean. If possible, isolate the clothing from the mannequin with de-sized muslin.
 12. Do not use pins, staples, monofilament line, adhesives or tapes with textiles.
 13. Mounting flat textiles for exhibition is a special problem. Please contact the conservator for advice.
 14. Never iron a textile from the collection.
 15. Textiles are very tactile and people naturally want to touch them. Create barriers with plexiglas, rope, distance or platforms. Signs, although obtrusive, also help. Look for similar replica materials for a hands-on part of the exhibit, if desired. Contact the Wyoming State Museum's Exhibits Division for advice.
 16. Do not allow eating, drinking, smoking or pets in the exhibit area.

Storing Textiles: The storage room should be in an untraveled area which is light tight, devoid of insects and other pests, and has stable humidity and temperature. Most important, it must be clean. Do not allow eating, drinking or smoking in the storage area. Ideally, all textiles should be stored flat in cabinets, but this is usually not practical, as it would require an incredible amount of space. Therefore, other methods must be considered.

Acid-free boxes are good for the storage of small textiles and fragile clothing that cannot be hung. If a textile requires folding to fit into a box, pad the folds with crushed acid-free tissue. Also pad clothing, hat and shoe interiors to avoid creasing and collapse. Try to avoid stacking textiles in the box, but if necessary, pad between layers and place heavier textiles on the bottom. Do not stack these boxes on the floor (use shelves or pallets) or to great heights, as the weight may crush the lower ones.

A better alternative to folding large flat textiles such as quilts or rugs is rolling. Acid-free tubes provide an easy and proper means of storage. Cardboard tubes can be used; but they must be covered with mylar to protect the textile from acid migration from the tube. It is important that the tube be three inches or more in diameter, sturdy enough to support the weight of the textile and extend at least one inch beyond each end of the rolled textile. It is helpful to have one person on each end during the rolling procedure. Carefully roll the flat textile onto the tube, right side outward. Avoid creases. Cover the rolled textile with de-sized muslin or acid-free tissue and tie loosely with cotton twill tape. Attach an identification tag to the outside of the roll, listing the accession number, object name and type of fabric. Wooden dowels or metal pipes can be inserted in the tubes and supported horizontally on storage racks.

If clothing is strong enough, it should be hung on padded hangers. Never hang directly on unfinished wood or metal hangers. Do not cover clothing with dry cleaner plastic bags as these are usually manufactured from a poor grade of plastic. Stuff sleeves lightly with crushed acid-free tissue. Always fasten buttons, hooks and eyes, and zippers. Storage units for hanging clothing can also be constructed. Do not hang very heavy objects such as heavily beaded dresses, or those which have very narrow straps. Contact the conservator for advice.

If wooden shelves are used, several coats of moisture-curing polyurethane sealer (not an oil-based polyurethane, this produces damaging gasses as it ages) should be applied and the textile should be isolated from the wood with ethafoam, mylar D, acid-free tissue paper, or acid-free blotter paper. Avoid stacking textiles on each other. Shelving should not be placed directly against outside walls. Leave an airspace of at least 6 inches between any storage unit and an outside wall.

Label or tag the outsides of boxes, wrappings, cabinets, etc. with the accession number and textile name. This will allow for easy identification without disturbing the textile. Work tables in the storage room must be clean and have no protruding nails or jagged edges to snag textiles.

If you have any questions please contact the conservator. See Appendix I Materials and Supplies, p. 49-50, for acid-free tissue and other materials.

Cleaning: The only form of textile cleaning that can readily be done on site is vacuuming, which removes dust, loose dirt and debris. Textiles in period room settings such as rugs, upholstery, drapes, bedding, etc. will require more frequent cleaning than those in enclosed exhibit cases or in storage.

The textile should be on a flat, clean surface. Place a piece of bound fiberglass screen between the vacuum nozzle and the textile. Binding the screen edges with cloth tape prevents snagging. Use minimum suction (a brush attachment helps) and stroke with the weave, rather than in a diagonal direction. Do not vacuum fragile or torn areas.

Even if textiles are heavily soiled or stained, do not attempt wet cleaning. Contact the conservator for advice.

PAPER ARTIFACTS

Paper is a non-woven, felted material of individual fibers, usually cellulose, which is formed into continuous sheets. The material's life span depends upon its fiber content and manufacturing procedures. Paper made of wood pulp can be very unstable and acidic. Unfortunately, wood pulp is common in historical artifacts. Within historical collections, there are

forms of paper that were never intended to be permanent. Newspapers, posters and handbills were intended to convey current information then thrown away. This creates a difficult situation when it comes to preservation.

No matter what its quality, natural aging factors will eventually cause deterioration in all paper. It is, however, careless handling, bad storage conditions and contact with improper materials that destroy most papers.

Like textiles, paper is very hygroscopic and is damaged by humidity which is too high, too low or which fluctuates too much. It is easily yellowed and degraded by exposure to high light levels and to air pollutants.

Exhibiting paper: For exhibit, artworks on paper should be matted on acid-free matboard with archival hinging material and framed. The acids which occur naturally in ordinary matboard, cardboard and wood will migrate into the object causing embrittlement and discoloration. A window mat should be used to provide an airspace between the object and the glazing of the frame. Never dry mount a paper artifact. This is an irreversible process which not only makes the object look unnaturally flat and stiff, but will also eventually yellow and embrittle the object. Never apply any kind of pressure sensitive (Scotch-type) tape, glue or rubber cement to a paper artifact. Fragile paper objects can be enclosed between two pieces of mylar, a process called encapsulation. This provides a completely reversible means of protecting the object while allowing both sides to be viewed. Contact the conservator to arrange for encapsulation.

Storage: Unmatted paper objects in storage must be kept in acid-free folders. These may be either buffered or unbuffered. By using acid-free materials you can insure that the folders are not producing acids which will contribute to the breakdown of the objects. The buffer is a chemical which absorbs acids naturally produced by the paper as it ages. Absorbing these acids prevents them from further accelerating the deterioration of the paper.

When handled, paper objects should be laid on a piece of acid-free matboard and the board, rather than the paper, handled. Paper is easily stained and soiled and should be handled only with clean white cotton gloves, unless it is extremely brittle and fragile.

Cleaning: Do not attempt to clean or repair paper objects. Due to the fragile nature of old paper, no form of cleaning can be routinely recommended. Virtually all commercially available tapes and adhesives eventually become irreversible and brittle, and stain the paper. Paper objects in need of cleaning or repair should be referred to the conservator.

PHOTOGRAPHS

Photographs are usually made up of microscopic silver particles or, in the case of color photos, dyes, suspended in an emulsion layer of gelatin which is adhered to a paper backing. This complex structure makes photos especially sensitive to relative humidity problems. The dyes of color photographs are very sensitive to light and fade quickly.

In general, photos should be exhibited and stored like paper objects. It is important to wear clean cotton gloves while handling photographs; touching the front of a photograph with bare fingers will leave permanent fingerprints in the emulsion layer.

When selecting sleeves and other storage enclosures for photographs, use acid-free, unbuffered materials, because the emulsion layer of a photograph is naturally somewhat acidic and would be damaged by the buffer.

PAINTINGS

Paintings are fragile structures comprised of several layers. Each layer in the structure reacts differently to changes in relative humidity and temperature and to aging. Materials such as canvas and wood undergo extreme dimensional changes as they absorb and release airborne moisture. Components of other layers such as the size, ground and paint will also react to moisture. Because these materials become brittle with age, expansion and contraction becomes increasingly destructive, causing splits, cracks and deterioration of the bonds between layers. Canvas supports can become slack or tight during environmental fluctuations. Curatorial staff are encouraged to become familiar with the appearance of their painting collection so that changes will be quickly noticed.

If damage and/or changes occur to a painting, contact the conservator concerning what steps to take.

The following will familiarize you with what you need to think about and look for during periodic inspections.

The **support** is the rigid or semirigid surface upon which the paint is applied. In most cases a painting support is canvas, though it is occasionally silk, wood or cardboard.

For canvas paintings the auxiliary support consists of a wooden stretcher or strainer. For panel paintings there may also be a "cradle" of wooden battens attached to the back of the panel. Cradles were frequently applied to panel paintings by restorers in attempts to prevent the panels from warping. They are usually unsuccessful and often cause further damage in the form of checks and/or splits.

A **stretcher** is a wooden frame-like expandable structure to which the canvas is tacked. At each corner, stretchers usually have wooden keys or metal devices for expanding the stretcher if the canvas becomes slack. Keys often become dislodged.

Before hanging paintings, check wire, screws, hangers and frame. All parts that are to bear weight must be capable of carrying the load. If a plaster wall is found to be insecure, contact the appropriate personnel so that repairs can be made to the wall before a painting is hung. Obtain the appropriate authorization before making new holes in the walls of any historic structure.

Cleaning: Limit cleaning of stable paintings to dust removal with a soft, dry sable hair brush once a year. If the paint is cleaving or flaking or the varnish is cracked or damaged, do not dust the painting.

Starting at one side of the top of the painting, gently sweep the hairs of the brush horizontally across the surface without applying pressure, moving to the opposite side. Away from the painting, vacuum the tip of the brush to remove dust. Work your way across the surface, from top to bottom, always moving in the same direction. Never vacuum a painting.

If a frame is in good condition, it may be vacuumed once a year by using a clean, soft brush attachment. When vacuuming the frame, do so with gentle action and care. A careless blow to a painting or frame could severely damage it. Do not vacuum any frame which has loose elements or flaking paint or gilding.

Never under any circumstances use commercial cleaning solutions, solvents, water, or oils on paintings. Cleaning beyond that outlined above is to be done only by trained conservators.

Section III:

Forms

SECTION III

FORMS

The conservation forms used to record the condition and treatment of objects at the Parks and Historic Sites are the same as those used at the Wyoming State Museum.

These are:

1. CONDITION REPORT FORM
2. ADDITIONAL COMMENT FORM
3. DAMAGE REPORT FORM

Examples of these forms are provided in this section.

The condition report form provides general information, a check off list and areas to clarify specific condition problems. It is organized in such a way that it should help you in the examination and evaluation of both new objects or those already in your collections which have simply not yet been examined closely. Call the conservator for help in filling out this form. The reverse of this form is a treatment proposal form for use by the conservator only.

The additional comment form is for use in conjunction with the condition report form when that form is full or when there is additional information which doesn't fit the categories on that form.

The damage report form is to be filled out and copies sent to the conservator and registrar (Wyoming State Museum, 2301 Central Ave, Cheyenne, WY 82002) whenever damage to a collection object is noticed, regardless of the cause. This is to keep the conservator informed of the condition of the collections, and to help in the scheduling and preparation for visits to the sites. Contact the registrar immediately if insurance procedures need to be initiated.

Condition Report

Object Name: _____

Accession Number: _____

Measurements: _____

Object Location: _____

General Structure: _____

Date: _____

Examiner: _____

Site: _____

SPECIAL RECOMMENDATIONS

- ☐ Stable
- ☐ Unstable/active deterioration
- ☐ Unstable for exhibit
- ☐ Unstable for travel
- ☐ Improve storage/display
- ☐ Regular inspection at _____ months intervals

Comments: _____

CONDITION PROBLEMS

Check where applicable &/or (e) estimated or appears to be by examiner or (a) laboratory analysis necessary

SUPPORT/MAIN BODY

- ☐ 1. Abrasion
- ☐ 2. Acidic
- ☐ 3. Bent
- ☐ 4. Broken elements
- ☐ 5. Bulge
- ☐ 6. Check
- ☐ 7. Chip
- ☐ 8. Crack
- ☐ 9. Crease
- ☐ 10. Dent/depression
- ☐ 11. Fill
- ☐ 12. Fire damage
- ☐ 13. Fold
- ☐ 14. Foxing
- ☐ 15. Gouge
- ☐ 16. Hole, puncture
- ☐ 17. Insecure attachments
- ☐ 18. Insect damage
- ☐ 19. Late elements
- ☐ 20. Loose joints
- ☐ 21. Missing elements

- ☐ 22. Patch
- ☐ 23. Previous treatment/repair
- ☐ 24. Separated elements
- ☐ 25. Shedding
- ☐ 26. Shredding
- ☐ 27. Split
- ☐ 28. Stiffness/embrittlement
- ☐ 29. Tear
- ☐ 30. Twist
- ☐ 31. Warp
- ☐ 32. Water damage
- ☐ 33. Wrinkle
- ☐ 34. Yellowing
- ☐ 35. Other

DESIGN LAYERS

- ☐ 36. Abrasion
- ☐ 37. Blisters
- ☐ 38. Brittleness
- ☐ 39. Cleavage
- ☐ 40. Crackle

- ☐ 41. Cupping
- ☐ 42. Discoloring
- ☐ 43. Inpaints
- ☐ 44. Loss
- ☐ 45. Overpaint
- ☐ 46. Powdering
- ☐ 47. Tenting
- ☐ 48. Other

FINISH/SURFACE

- ☐ 49. Abrasion
- ☐ 50. Accretions
- ☐ 51. Adhesive residue
- ☐ 52. Blanching
- ☐ 53. Bloom
- ☐ 54. Cleavage
- ☐ 55. Corroded
- ☐ 56. Crazing
- ☐ 57. Discoloration
- ☐ 58. Dust
- ☐ 59. Early finish removed
- ☐ 60. Extreme gloss

- ☐ 61. Finger marks
- ☐ 62. Improper acc. #
- ☐ 63. Irregular gloss
- ☐ 64. Late surface coating
- ☐ 65. Loss
- ☐ 66. Mold/fungus
- ☐ 67. Overpolished
- ☐ 68. Polish residue
- ☐ 69. Smoke damage
- ☐ 70. Stain
- ☐ 71. Sticky surface
- ☐ 72. Tarnish
- ☐ 73. Tape, labels
- ☐ 74. Yellowing, darkening
- ☐ 75. Other

FRAMING

- ☐ 76. Unframed
- ☐ 77. Improper framing hanging equipment
- ☐ 78. No backing board
- ☐ 79. Other

COMMENTS (Key to CONDITION PROBLEMS numbers)

Treatment Proposal

Accession Number _____ Object Name _____

PROPOSED TREATMENT

FOR CONSERVATOR'S USE ONLY

☐ Beyond Wyoming State Museum capabilities. Contract conservation necessary.

Estimated cost for contract conservation: _____ by _____
date _____

FOR CONSERVATOR'S USE ONLY

STORAGE/EXHIBIT RECOMMENDATIONS

Estimated date to begin treatment _____

By _____
Project Conservation Staff Member

Approved _____
Chief Museum Conservator

Concurrence _____
Authorized Custodian Only

Estimated date of completion _____

Date _____

Date _____

Date _____

Additional Comments Form

Analytical technique(s) employed & results

Implications of technical data with respect to probable age, origin, & authenticity of object

(e) = estimated or appears to be by examiner
(a) = laboratory analysis necessary

Project Conservation Staff Member

Chief Museum Conservator

DAMAGE REPORT

OBJECT _____ PERSON REPORTING _____
ACCESSION NUMBER _____ DATE OF REPORT _____
INVENTORY LOCATION _____ PHOTOGRAPHS: B/W _____ NEG. # _____
SITE _____ COLOR _____ SLIDE # _____

ATTACH FULL CONDITION REPORT
NOTIFY CURATOR AND CONSERVATOR IMMEDIATELY

LIST PHYSICAL CHANGES THAT HAVE OCCURRED TO THE OBJECT AS A RESULT OF THE DAMAGE:

SUMMARY OF CONDITION AFTER DAMAGE:

_____ generally unsound
_____ generally sound
_____ insecure
_____ disfigured
_____ incomplete
_____ stable
_____ secure

DAMAGE ESTIMATED TO BE: _____ structural damage
_____ surface damage

_____ requires further examination
_____ requires minor treatment
_____ requires major treatment
_____ irreparable

SUGGESTED TREATMENT: _____

DAMAGE DUE TO (check all that apply):

_____ accident
_____ vandalism
_____ deterioration
_____ improper handling
_____ water (flood, freezing, etc.)
_____ insect/rodent
_____ fire/smoke
_____ heat
_____ mold/mildew
_____ chemical
_____ other: _____

ARTIFACT LOCATION WHEN DAMAGE OCCURED:

_____ museum exhibit
_____ museum storage
_____ site exhibit
_____ site storage
_____ on loan
_____ traveling
_____ other: _____

WERE ALL PIECES/PARTS RECOVERED? _____ YES _____ NO

LIST PIECES/PARTS MISSING: _____

LOCATION/DISPOSITION OF BROKEN PIECES/PARTS OF OBJECT: _____

RECOMMENDATIONS TO AVOID THIS TYPE OF DAMAGE IN THE FUTURE: _____

COMMENTS/CLARIFICATION: _____

Section IV:

Disasters/ Emergencies

SECTION IV

DISASTERS/EMERGENCIES

A disaster or emergency is an event occurring with little or no warning, causing more disruption or destruction on site than personnel can correct by their own resources.

Disruptions requiring outside assistance may come in the form of:

Natural Disasters

Blizzard or heavy snow fall
Sleet, hail, or ice
Tornado
Slow-rising flood
Flash flood
Earthquake

Accidents

Broken pipelines
Broken water lines
Downed powerlines
Vehicular

Human-related

Medical emergency
Vandalism, sabotage
Civil disorder

Industrial

Water, fuel or electrical failure
Explosion
Sewer backup
Fire
Collapse of structure

Disaster planning can be divided into three phases:

1. Risk reduction - steps to take before a disaster strikes, to reduce the impact.
2. Immediate actions - to take when an emergency occurs.
3. Recovery - What to do after the immediate emergency is over to get back to normal.

Disaster Risk Reduction

There are many steps which should be taken in advance to reduce risk and severity of a disaster.

Flooding, general:

- Avoid storing objects near potential leaks (overhead pipes, etc.)
- Keep objects off the floor, use shelving, pallets, etc.
- Check drains, pipes, tanks regularly.
- Know location of, and clearly mark, main water shut-off valves.
- Check condition of roof, gutters and drains during storms.
- Prevent pipes from freezing by insulating or leaving a tap open during very cold weather.
- Have plastic sheet, tape, stapler and staples, buckets, mops, sponges, paper towels on hand.

Flooding from rising river or stream, if advance warning is given:

- Empty low cupboards and shelves.

- Move objects upstairs or to higher shelves.
- Protect immovable objects with plastic sheet.
- Switch off electricity if flooding is imminent.

Fire:

- Limit amounts of flammable chemicals on hand.
- Label and store flammable chemicals properly in flammable chemical storage cabinets away from exhibit and collection storage areas.
- Prevent static and other electric sparks when handling flammable chemicals.
- Use adequate ventilation when using flammable chemicals.
- Have electrical tools and equipment properly wired and grounded.
- Inspect and maintain multi-purpose dry chemical fire extinguishers regularly.
- Know location and use of fire extinguishers.
- Know location of, and clearly mark, fuse box and electrical shut-off. Make as accessible as possible.
- Know and practice emergency exit procedures.
- Have fire department phone number posted by each phone.

Theft/vandalism:

- Limit access by locking doors, windows, gates, storage areas.
- Cover tempting targets from casual view.
- Have formal check-in/check-out procedures to account for all objects.
- Know how to secure premises in case of emergency.
- Note and report suspicious loiterers.
- Keep valuable objects and petty cash in a secure location.
- Keep keys in a locked key box.

General:

- Have building plan showing doors, windows, exit routes, hazardous and flammable chemical stores, fire extinguishers, electric and water shut-offs. Have copies available for fire department, etc.
- Have up to date lists of chemicals in each chemical store.
- Keep walkways and emergency exits clear.
- Have backup copies of all vital documents stored securely off-site.
- Have a first aid kit, properly stocked.
- Make mutual aid agreements with other museums, etc.
- Be prepared to assist in emergencies at other locations. Keep a list of available equipment and supplies. Plan how to transport supplies and staff to site. Plan how staff will be integrated into recovery efforts.
- Designate an emergency recovery team and assign general responsibilities to each member. Keep an updated list of team members, their work and home phone numbers and their responsibilities. Make sure they all know what will be expected of them in case of emergency.

- Post a list of emergency phone numbers (on a separate sheet for easy updating) near each telephone.
- Have emergency kit standing by.- Arrange access to emergency secure storage area to be used in the event a disaster renders the regular facilities insecure.
- Locate the nearest source of large scale refrigeration, freezing and freeze-drying equipment and services.

Immediate Actions

Steps to take when an emergency occurs.

Fire:

- Call for help from co-workers.
- Use fire extinguishers if feasible.
- Call fire department.
- If necessary, evacuate building, closing doors and windows behind you, assemble at a pre-arranged place for head count.
- Notify those who need to know:

Site Curator	See phone list, Appendix I (p.49)
Historic Sites Supervisor	"
Curator of Collections	"
Conservator	"
Registrar	"
Emergency Recovery Team	"

Flood:

- Call for help from co-workers.
- Shut off water mains in cases of pipe failure, etc.
- Shut off electricity if wiring or electric equipment is in danger of being wet.
- Call plumber or fire department as appropriate.
- Cover, raise or move objects as necessary to protect from water.
- Notify those who need to know:

Site Curator	See phone list, Appendix I (p. 49)
Historic Sites Supervisor	"
Curator of Collections	"
Conservator	"
Registrar	"
Emergency Recovery Team	"

Theft/vandalism:

- Call police.
- Secure building.
- Get description of thief, vehicle, license number, etc.
- Notify those who need to know:

Site Curator	See phone list, Appendix I (p. 49)
Historic Sites Supervisor	"
Curator of Collections	"
Conservator	"
Registrar	"
Emergency Recovery Team	"

Medical emergency:

- Notify someone trained in first aid.
- Call ambulance (911).

Recovery

Steps to take after the danger to people has passed.

- Assess the situation. The fire marshall or other authority may declare your premises "off limits" if there are toxic combustion by-products, contamination by hazardous materials such as asbestos, questions of structural integrity, etc.
- Find and gain access to the nearest working telephone.
- Notify disaster recovery team, also
 - Site Curator See phone list, Appendix I (p. 49)
 - Historic Sites Supervisor "
 - Curator of Collections See phone list, Appendix I (p. 49)
 - Conservator "
 - Registrar "
- Secure buildings if possible, if not,
- Prioritize object and equipment recovery according to:
 - severity of damage
 - potential for continued damage
 - value
 - effort required
 - availability of supplies, equipment, workers.
- Remove objects and valuable equipment to pre-arranged secure location.
- Devise a means of recording objects moved and new locations.
- Set cleanup priorities and assign tasks.
- Obtain necessary equipment (See phone list, appendix I, p.49)
- Devise procedure for integrating volunteer help, including identification and supervision.
- Appoint liaison for dealing with officials, press, insurance investigators, etc.

As soon as human safety is no longer a concern, collections have been removed or otherwise protected from the source of the disruption, and you have determined the approximate extent of damage, call the Parks and Historic Sites Manager at (307) 777-6318 or the Curator of Collections at (307) 777-6000. If you are unable to reach either of them, call the Museum Director at (307) 777-7032. Your next call should be to the Conservator at (307) 634-0613, who will assess the situation and advise you on specific steps to take. Time is a critical factor, especially if the disaster involves fire or water.

Staff from the museum should arrive as soon as possible, if necessary. In the meantime, the conservator will probably suggest the following:

1. Begin to recruit volunteers. Have a list of phone numbers prepared in advance: staff, docents, local people who have an interest in the site.
2. Set up a disaster recovery command center. If weather is inclement, perhaps a nearby house, garage, or barn will suffice.
3. Begin to assess those who offer help. Over-zealous volunteers who attempt restoration when they should be evacuating items can cause as much damage as thoughtless, careless workers. Workers of either type should be dismissed.

Do not allow anyone to disturb prints, photographs, drawings, or paintings. Do not attempt to separate wet single sheets of paper or open wet books. Such handling can result in extensive damage to materials that otherwise might be salvaged. Reducing the cost of future conservation must be one of the top priorities of the salvage operation.

4. If house electricity is not available, rent portable generators to provide electricity for lights, fans, dehumidifiers, and other electrical services. For safety, all electrical lines should be waterproofed and grounded.
5. Remove any standing water which has collected in trash cans, drawers, etc. Remove puddles by using wet/dry vacuum cleaners, mops, squeegees or towels.
5. Immediately prevent the formation of areas of moist, warm, stagnant air. Create maximum air flow through all affected areas by opening doors and windows. If you have electricity, use as many fans as can be acquired to create a current of air placed to expel the humid air from the building. If dehumidifiers are available, they may be used with fans for small enclosed areas.

Reduce all heat in the building. Turn thermostat to between 50 to 60 degrees. In summer, reduce the temperature as much as possible through air conditioning, if available.

6. Begin to record damage with photography. Staff from the Wyoming State Museum should arrive soon, bringing specialized supplies and equipment.

Unless collection objects are in immediate, obvious peril, it is suggested that they be left in place to await the arrival of special storage boxes, waterproof paper, moving blankets, and other supplies. This will reduce the number of times they are handled.

Appendices:

Materials & Supplies

Glossary

Bibliography

Emergency Phone
Numbers

APPENDIX I

MATERIALS AND SUPPLIES

<u>material</u>	<u>supplier</u>
ethyl alcohol (ethanol, grain alcohol, denatured alcohol)	Local drug store
Health & safety supplies (disposable gloves, masks, etc.)	Lab Safety Supply PO Box 1368 Jamesville, WI 53547-1368 (800) 356-0783 Industrial Safety and Security 1390 Nevbrecht Road Lima, OH 45801 (800) 537-9721
Cotton gloves, acid-free storage boxes, papers, mounting materials, UV filtering sleeves, etc. (<u>call for free catalogs</u>)	University Products, Inc. PO Box 101 South Canal Street Holyoke, MA 01041 (800) 628-1912 The Hollinger Corp. 3810 S. 4-Mile Run Drive PO Box 6185 Arlington, VA 22206 (703) 671-6600 Conservation Materials, Ltd. 1275 Kleppe Lane, #10 Sparks, NV 89431 (702) 331-0582 Gaylord Bros. P.O. Box 4901 Syracuse, N.Y. 13221-4901 (800) 448-6160 Light Impressions 439 Monroe Ave. P.O. Box 940 Rochester, NY 14603-0940 (800) 828-6216

Hard plastic (polystyrene)
boxes

Gary Plastic Packaging Corp.
3629 W. MacArthur Blvd.
Suite 214
Santa Ana, CA 92704-6894
1-800-222-GARY

polyethylene foam (Ethafoam for
example. Avoid any with fire
retardant, anti-static or other
additives)

Shippers Supply-Custom Pack
1660 C N. 4th St.
Laramie, WY 82070
(307) 742-0459

UV filtering sleeves and films

Verilux Corp.
626 York St.
Vallejo, CA 94590
(800) 786-6850

Solar Screen
53-11 105th St.
Corona, NY 11368
(718) 592-8223

Madico, Inc.
64 Industrial Parkway
Woburn, MA 01888
(800) 225-1926

moisture curing polyurethane
sealer (Sherwin Williams
Rexthane Heavy Duty Polyurethane
Varnish, for example)

local paint store

APPENDIX II

GLOSSARY

Abrasion: loss or disruption of a surface as a result of rubbing or scraping.

Accession number: specific number assigned to an individual collection object for cataloging and/or record-keeping.

Accretion: a deposit of foreign material on a surface.

Batten (also called a cleat): an auxiliary piece of wood attached to another wood surface. Usually fastened in an attempt to hold a panel in place.

Blanching: a whitish discoloration, in a finish, usually caused by the introduction and evaporation of a solvent or water. It can be a residual precipitate from the varnish or a leaching of some of the medium.

Bleaching: a lightening of a surface. This is a common occurrence in finishes exposed to direct sunlight.

Bloom: a cloudy, whitish or bluish translucent discoloration of a finish, usually caused by the introduction of water (liquid or vapor).

Bright holes: holes in wood, caused by wood-boring insects. Light-colored holes indicate recent activity. In contrast, dark holes indicate inactivity.

Check: a partial split in wood along the grain. Checks develop because of uneven shrinkage of the wood.

Chip: a small loss.

Cleavage: cleavage is usually a separation between layers of a structure such as veneer separating from a secondary wood support, or varnish separating from paint, or paint from other layers of paint, or paint from support.

Compensate: to replace material that has been lost.

Consolidate: to stabilize a degraded or weakened structure by introducing into it or attaching to it materials capable of holding it together.

Corrosion: conversion of metal, particularly at and near its surface, into a more stable compound due to chemical or electrochemical reactions with its environment.

Crazing: a fine network of cracking in a finish that may impart an opaque appearance to the film.

Crackle pattern: the configuration of cracks in a paint or varnish film resulting from internal or external forces acting on the film as it is drying or after it has reached a brittle stage.

Dehumidify: to reduce the amount of water vapor in the air.

Dent: A concave depression caused by pressure or a blow.

Degradation: loss of original properties or stability as is seen in the discoloration, distortion, disruption, erosion, and disintegration of an object.

Disfigurement (also called disruption): a later modification that obscures or changes the original maker's intent. Disfigurement could be an accumulation of grime or

stains, as well as intentional changes.

Drying oil: an oil that has the property of forming a hard film when exposed to air, in contrast to a non-drying oil, which will not form a hard layer. Through aging, a drying oil film becomes more difficult to remove.

Element: an individual component of the total object.

Environment: all external conditions and influences affecting the chemical and physical stability of an object. This includes all gaseous, liquid, or solid matter that envelops or surrounds the object including chemical, physical, and biological agents capable of interaction with the object.

Environmental controls: electrical, chemical, or physical mechanisms that can favorably regulate the environment.

Figure (in wood): a surface pattern produced by the wood's anatomical structure. See also Grain.

Fill: compensation for a deep loss.

Finish: a surface coating. A finish may be transparent or translucent as in the case of a varnish, lacquer or shellac; or opaque, as in the case of a paint.

Frass: excretions of insect larvae and the refuse left by wood-boring insects.

Friable: easily pulverized or crumbled.

Fungus (also called mold or mildew): disfiguring growth that proliferates in high relative humidity, elevated temperatures, and stagnant air.

Grain (in wood): refers to the direction of the major longitudinal fibers in relation to the plane of a finished or cut surface. Wood grain can be irregular, as it is where the wood has knots.

Graining: paint or varnish layers applied to simulate wood grain. (Marbleizing employs the same materials and techniques, to simulate a marble surface.)

Grime: usually refers to surface dirt. However, grime can also be under a late finish and/or embedded in a finish.

Hide glue: a common water-soluble adhesive used in furniture construction. Hide glue is made from the skin, bones, and intestines of animals.

Hygroscopic: having the ability to absorb and release moisture in response to changes in relative humidity.

Inlay: a design layer set into the body of a surface for embellishment.

Inpaint: to apply paint within the boundaries of a loss of finish to complete the design. (Instain: to apply translucent stain within the same boundaries. See Overpaint.)

Insert: a piece of wood inserted and leveled off to the original profile of an artifact, usually to repair a break.

Joint separation: usually refers to a separation between structural elements or applied carvings and moldings of furniture. Does not apply when referring to laminated veneer or inlay. (See Cleavage.)

Knot: the base of a tree branch that is embedded in a tree

trunk or a larger branch and is visible on the surface of wood sawn from that area.

Late: any modification of an object's original appearance that occurred after the original maker completed the object.

Loss, lacuna, void: material separated from the whole and which may or may not be recovered.

Overpaint: to apply paint within, and extending beyond, the boundaries of damage on a finish.

Oxidize: to combine with oxygen. Oxidation usually contributes to degradation such as through the breaking of chemical bonds in a varnish film, the embrittlement of paper or textiles, or the corrosion of metals.

Patina: an aged appearance caused by environmental factors. Slowly developing patinas are often evidence of antiquity and should always be retained, unless the stability or the understructure of the artifact is threatened. Artificially induced patinas in most materials (including metals and finishes) are usually obvious to the experienced.

Polymerize: the joining of two or more molecules to form a larger, more complex molecule.

Primary element: an element visible when the object is in its usual placement: i.e., a drawer front.

Proper side: relative to an object, not to the viewer when standing in front of the piece. For example, the proper right side of a chair is on your right when you are sitting in that chair.

Relative humidity: the amount of moisture present in a given volume of air compared to the amount of moisture that volume of air could hold at saturation (100 percent) at the same temperature.

$$RH = \frac{\text{actual amount moisture}}{\text{maximum possible moisture}}$$

Reversibility: the use of techniques and/or materials that allow a repair to be undone.

Secondary element: an element that is not visible when the object is in its usual placement: i.e., a drawer bottom or the back of a case piece.

Shim: a strip of material, usually wood, used to fill a space or to level an object.

Size (or sizing): a material used to seal (or prime) a porous surface.

Split: a break completely through or across a piece of wood (see Check).

Stabilize: to make secure, as in reattaching joint separations and/or cleavage. Also, to stop deterioration or protect from further damage.

Strip: to remove a finish.

Support element: a brace or any device used to hold an object in its proper position.

Veneer: a thin layer, usually of wood, whose primary function is decorative. Veneer is attached to a secondary

understructure.

Warp: planar distortion.

Wax build-up: surface accumulation of various polishes and/or waxes. A wax build-up may also be impregnated with grime and other foreign staining materials.

Wood-borer: insect that tunnels through wood.

APPENDIX III

BIBLIOGRAPHY

Note: All the following publications are available for loan from the libraries of the Wyoming State Museum.

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- Rose, Carolyn L. and Amparo R. de Torres, eds. Storage of Natural History Collections: Ideas and Practical Solutions Society for the Preservation of Natural History Collections, Pittsburgh, PA, 1992.
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APPENDIX IV

EMERGENCY PHONE NUMBERS

To be filled out, photocopied and posted near each telephone.

Fire Department 911 or _____
Police Department 911 or _____
Ambulance 911 or _____
Site Curator _____
Site Maintenance day _____
night _____

Gas _____
Electricity _____
Water _____
Security service _____
Historic Sites Supervisor Mike Abel 1-777-6318
Wyoming State Museum 1-777-7022
Conservator Mark Fenn 1-634-0613 or 1-777-6000
(home 1-634-7151)
Curator of Collections Bob Gant 1-777-6000
(home 1-638-6175)
Director Dona Bachman 1-777-7032
(home 1-635-8034)

Electrician _____
Plumber _____
Locksmith _____
Window Glass _____
Equipment Rental _____
Other _____

Emergency Response Team (suggested members)

Coordinator _____
Recorder _____
Evaluator/prioritizer _____
Security _____
Volunteer supervisor _____
Press/Public liaison _____
Supplies/materials procurer _____
Other _____

