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ABSTRACT

This paper addresses the preservation needs unique to small libraries, where the majority of special collections exist. A preservation survey of the Herrick Memorial Library (Wellington, OH) was conducted to ascertain the condition of its 45,000 holdings and develop a practical low-cost disaster plan. Using accepted preservation survey criteria, the building and physical plant were examined in order to determine any susceptibility to environmental threat and if so, evaluate any impact it may have upon the library's collection. The study also examined a wide variety of preservation issues, from the existence of a written preservation plan to the extent of damage to the print collection from acidification. The research focused on four areas: (1) the extent of a preservation policy at any level within the library and how knowledgeable the staff was in preservation awareness and procedures; (2) an environmental survey to evaluate the suitability of the building for housing the collection; (3) a survey of the collection to assess the physical condition and state of repair of selected library holdings and to determine the nature and magnitude of any problems identified; and (4) the development of a practical and low-cost library disaster response plan. Includes the disaster plan, emergency instruction sheet, phone tree, recommended supplies, fire/disaster inspection checklist, emergency/fire evacuation plan, and key control log. The National Archive and Record Administration "Preservation of Water Damaged Library Materials" and flowchart illustrating the treatment of water damaged books and papers are appended. (Contains 11 references.) (Author/SWC)

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**PRESERVATION ASSESEMENT  
AND  
DISASTER RESPONSE PLAN**

**Herrick Memorial Library  
Wellington, Ohio**

**A Master's Research Paper submitted to the  
Kent State University School of Library Science  
in partial fulfillment of the requirements  
for the degree Master of Library Science**

by

**Mark Wisdom**

**December 1996**

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## Research Abstract

Much of the literature devoted to library preservation and conservation programs has focused largely on academic and large public libraries with considerable holdings and special collections. Much of this research has been conducted by the preservation specialist and archivist with little afterthought towards the application of their findings in settings outside of large library and archival collections. Few studies have been undertaken, however, in ascertaining the preservation requirements of small to medium public libraries. This paper addresses the preservation needs unique to small libraries where the majority of collections exist and enjoy the largest percentage of patron usage. A preservation survey of the Herrick Memorial Library (45,000 volumes) was conducted which ascertained the condition of its holdings and developed a practical low cost disaster program. Using accepted preservation survey criteria the building and physical plant were examined in order to determine any susceptibility to environmental threat and if so, evaluate any impact it may have upon the library's collection. The study also examined a wide variety of preservation issues from the existence of a written preservation plan to the extent of damage to the print collection from acidification. The core of the research focused on four areas. The first determined the extent of a preservation policy at any level within the library and how knowledgeable the staff was in preservation awareness and procedures. Secondly, an environmental survey was conducted to evaluate the suitability of the building for housing the collection. Third, a condition survey of the collection assessed the physical condition and state of repair of selected library holdings to determine the nature and magnitude of any problems identified. The last important area of research was the development of a practical library disaster response plan which could be implemented with minimal costs. The major assumption of this study was that the findings collected at the Herrick Public Library would parallel conditions found in other small public libraries of similar size, service area, and patron population. Recommendations and procedures developed during the course of this study should be applicable to similar institutions regardless of location.

**Master's Research Paper by**

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## **Introduction**

Much of the literature devoted to library preservation and conservation programs has focused largely on academic and large public libraries with considerable holdings and special collections. This is understandable given the preoccupation academic researchers have demonstrated with large easily researched institutions. Few studies have been undertaken, however, in ascertaining the preservation requirements of small to medium public libraries. The preservation research bias against smaller public libraries is unfortunate since the majority of library users patronize a local library often a branch or semi-rural facility averaging 35,000 to 60,000 volumes. It must be pointed out, though, while the preservation needs of a small to medium public library are narrower in scope than a program established at a larger institution it is still vital that preservation issues be addressed. At smaller libraries there are fewer periodicals as a percentage of the collection and many of the titles in greatest demand are ephemeral in nature and have a short shelf life. Bindery requirements and standards can be less restrictive and many materials eventually self delete from handling damage due to their initial cheap construction. Special collections are rare and if they do exist are small and usually consist of materials unique to the local area. But from a preservationist perspective this is also what makes them valuable not only to local citizens but scholars researching local history.

The loss of even a partial portion of a local library's collection can be devastating to local patrons who depend upon the library for much of their intellectual, creative, and general information needs. How smaller public libraries cope with preservation issues and plan for potential threats to their collections remains largely undocumented. This study examined the preservation needs of smaller institutions through conducting a case study of a typical smaller public library located in Wellington, Ohio. The study culminated in the development of a workable disaster response program, which it was hoped will serve as an initial model for other small public libraries.

## **Literature Review**

A thorough review of current literature addressing preservation issues challenging small and medium public libraries is almost non-existent. The vast and ongoing preservation literature is devoted to every type of collection and problem except those facing smaller libraries. This paucity of research literature is unfortunate since given the limited resources available to many public libraries there are few dollars which can be devoted to preservation specific publications. If on-going research in this area is not readily available in typical publications such as *Public Libraries* and *Library Literature* few public librarians will be aware of the full extent of the preservation challenges confronting them. The major serial which

addressed preservation and public libraries was *Library Literature* with fifty six hits under "library preservation", 45 hits under library disaster planning, and 63 hits under "conservation, planning, library. None of these, though addressed anything but large public libraries. A similar search found little within "Rural Libraries", and "Conservation Administration News". An article published in the "North Carolina Libraries" v. 52 (Spring 94), Taming the chimera: preservation in a small public library, was the only specific item found addressing preservation issues within small collections. Unfortunately it is only two pages long its limited scope contributes little to research. One valuable article is "Disaster: prevention, preparation and action", *Library Trends*, Fall, 1981. This article covers disaster plans in such a way that the recommendations offered are easily applicable to small libraries. Planning for Preservation, Association of Research Libraries, Office of Management Services, 1993, is another valuable resource for smaller libraries although like the majority of articles found during this literature search it is primarily concerned with large public, academic, and government libraries. Preservation and Conservation in the Small Library, American Library Association, 1989, is the only publication I found which addressed the preservation challenge to smaller public institutions. This ALA publication is brief and provides a good fundamental introduction and outline for the small library concerned with developing a basic preservation program. An increasing number of libraries and major archives are publishing their disaster plans and experiences on the Internet. The National Archives Records Administration, University of Pittsburgh, and the California State Archives have made their disaster plans and recommendations available for downloading by anyone with access to a modem and the Internet.

#### Study Objectives

The objective of this study was to conduct a preservation survey of the Herrick Memorial Library and ascertain the condition of its holdings and develop a practical low cost preservation plan with a special emphasis upon a disaster program. The building and physical plant were examined in order to determine any susceptibility to environmental threat and if so, evaluate any impact it may have upon the library's collection. The study examined a wide variety of preservation issues from the existence of a written preservation plan to the extent of damage to the print collection from acidification. The core of the research focused on three areas. The first attempted to ascertain to what extent a preservation policy existed at any level within the library and how knowledgeable the staff was in preservation awareness and procedures. Secondly, an environmental survey was conducted to evaluate the suitability of the building for housing the collection. Third, a condition survey of the collection assessed the physical condition and state of repair of selected library holdings to determine the nature and magnitude of any problems identified.

The major assumption of this study was that the findings collected at the Herrick Public Library would parallel conditions found in other small to medium public libraries of similar size, service area, and patron population. Small to medium public libraries are defined in this study as those which house collections ranging from 10,000 to 150,000 volumes with an average of around 35,000 to 60,000 items. It



is also assumed that recommendations and procedures developed during the course of this study would also be applicable to similar institutions regardless of location. Prior to conducting the study basic information about the library and its collection was collected and analyzed. The nature of the collection, types of patrons, quality of staff, age of the building, capacity, etc., were examined in order to establish a survey plan and establish priorities. Some of this information has been collected from public records and a brief examination of the library's 1995 Summary Report and through interviews with the library director and selected staff. This information is summarized as follows. The Herrick Memorial library has 43,184 volumes and 34,800 titles. The library's extended collection includes 160 subscriptions, 64 bound periodicals, 7,935 microforms, 2, 583 audio-visual titles to include cassettes and compact disks as well as ten original paintings and two prints by the nineteenth century painter Archibald Willard. The collection is housed in a building of 7,700 square feet accommodating 77 patrons and had a combined operating expense (including personnel) of \$318,008 for fiscal 1995. An average of 1,200 patrons a week visit the library generating approximately 145 reference transactions and an annual circulation of 104,000 materials including inter-library loan. While circulation has remained relatively steady the growth in use of computer based services has dramatically increased with the library's four computers in constant demand.

Based upon the above information and the type of collection it was determined that only certain printed materials would be examined and that a desired goal of the study would be to establish a baseline for the development of a formal preservation plan with a special emphasis on a working disaster preparedness program. The physical examination of selected library holdings was limited to hardbound items with an emphasis upon literature, biography, history, and special collection printed items (the library maintains the local high school's historical record of yearbooks).

The first portion of the study consisted of interviews with the library director and available staff members. These interviews assisted in assessing the level of preservation awareness among staff and the evaluation of any current preservation policies and procedures. Specifically the researcher set out to determine if the library had any policies and programs developed, either formally or informally, which specifically addressed preservation issues. For example, did a preservation officer exist within the staff? Was there any mention of preservation issues in the library's mission statement and did the Director understand basic preservation principles.

Based upon this initial research it was determined that some preservation practices do exist and are implemented albeit in an informal manner. Materials are examined when they come in. Videos must be brought to the front desk and not placed in the book drop. Interior and exterior cleaning have been contracted out. The inside is cleaned about every two weeks and the exterior windows around twice a year. The Director has in the past diverted funds from the library's travel and conference budget to preservation training seminars. The staff member tasked to conduct in house repairs is thorough and concerned about quality. She avoids whenever possible using repair materials which may introduce secondary damage or accelerate existing problems. Materials are shelved properly though space is now a serious problem.

Electronic files are downloaded daily from the main system and information from the other systems an average of once a month.

The Director has no written deselection policy but relies on her experience and knowledge of the collection when weeding materials. Unwritten preservation concepts play a major role in her deciding which materials to retain. She and her staff consider the physical condition of an item as part of the deselection decision process. But without the establishment of a sound preservation plan the library director must rely on her professional knowledge and intuition when making decisions about materials and establishing priorities for the collection during or after an emergency.

The next portion of the study involved conducting an environmental survey. The survey focused upon those physical features which promote or threaten or have the potential to obstruct the sound preservation of the library's collection. Four specific areas were examined; environment within the building, the exterior and interior of the building, physical security, and storage areas/working areas. The building was renovated in 1986 and conforms with the current state building code for a public structure. The preservation of the original building was a major architectural requirement specified by those who approved the building's construction levy. But did the recent renovation promote or hinder preservation efforts?

A third element within the study consisted of a conditional survey of selected collection items. This examination assessed the level of acidification and the overall physical condition of selected materials. Acidification was determined using an acid pen, the three fold test, and extent of discoloration within the item. The condition range extended from good (no damage/evidence of acidic deterioration) to mild, moderate, advanced, and brittle. Physical integrity referred to the level of damage sustained from twisted spines, separation of various parts of an item, loose pages, and extent of sturdiness.

The fourth portion of this project consisted of the development of a practical low cost preservation plan to include a disaster response standard operating procedure. While the other portions of the study will examine the issues of preservation awareness and collection condition the last phase of research will culminate in a product which hopefully will address many of the findings which emerge from the first three parts of the study. This portion of the overall project, hopefully, will serve as a practical usable model for other similar libraries operating under the same constraints and budget limitations experienced by the Herrick Public Library.

### **Methodology**

This study consisted of the physical examination of selected collection items using a checklist based upon standard preservation practices. The collection examination was conducted by the researcher with no assistance from any staff member except when access was required to secured portions of the building. The research was limited to the Herrick Public Library and was not extended to any ancillary activities of the library. The examination of collection items was driven by the characteristics of the collection and was

limited to hardbound items and materials considered special or of historical importance. Every tenth hardback book from the areas of literature, history, and biography, were examined for a total of one hundred and seventy eight books. Paperbacks of all kinds, children's literature, periodicals, and popular fiction were excluded from the study due to their short shelf life. The historical range for the other items under consideration extended from 1995 back to nineteenth century. This ensured that the entire extent of the collection selected for examination was covered.

Herrick Library, located in Wellington, Ohio, is a small public library which serves a diversified rural and growing suburban community of 8,600. The building, renovated in 1986, is a registered national historical place and was built in 1902 upon the site of the Old American House scene of the famous Oberlin/Wellington slave rescue in 1858. Three full time and nine part time employees work at the library with only the director possessing an M.L.S. The area, until recently, was semi-rural with a large agricultural base supplemented by small manufacturing facilities. In the last ten years the area has experienced rapid growth with many families moving from the west Cleveland suburbs as well as spillover from growth in Oberlin seven miles north of Wellington. The rapid increase in population without any substantial percentage increase in library revenues has strained the library's budget and directly inhibited the development of a preservation program

It must be pointed out, however, while the preservation needs of a small to medium public library are narrower in scope than a program established at a larger institution it is still vital that preservation issues be addressed. At smaller libraries there are fewer periodicals as a percentage of the collection and many of the titles in greatest demand are ephemeral in nature and have a short shelf life. Bindery requirements and standards can be less restrictive and many materials eventually self delete from handling damage due to their initial cheap construction. Special collections are rare and if they do exist are small and usually consist of materials unique to the local area. But from a preservationist perspective this is also what makes them valuable not only to local citizens but scholars researching local history.

The aim of this study was to conduct a preservation survey of the Herrick Memorial Library and ascertain the condition of its holdings. This included an evaluation of the library building and physical plant in order to determine its susceptibility to environmental threat and if this would have an impact upon the library's collection. This study also examined a wide variety of preservation issues from the existence of a written preservation plan to the extent of damage to the print collection from acidification. Three surveys were conducted. The first investigated to what extent a preservation policy existed at any level within the library and how knowledgeable the staff was in preservation awareness and procedures. Secondly, an environmental survey was conducted to evaluate the suitability of the building for housing the collection. Third, a condition survey assessed the physical condition and state of repair of selected library holdings to determine the nature and magnitude of any problems identified.

Prior to conducting the study basic information about the library and its collection had to be collected. The nature of the collection, types of patrons, quality of staff, age of the building, capacity, etc., first had to be examined in order to establish a survey plan and establish priorities. This information was collected from the library's 1995 Summary Report and an initial interview with the library director. To summarize, the Herrick Memorial library has 43,184 volumes and 34,800 titles. The library's extended collection includes 160 subscriptions, 64 bound periodicals, 7,935 microforms, 2,583 audio-visual titles to include cassettes and compact disks as well as ten original paintings and two prints by the nineteenth century painter Archibald Willard. It also has an automated bibliographic and circulation system and offers computer databases. It is connected on-line through the Loraine Public Library Network through a telnet connection and uses a Gaylord interlibrary service which links it with Ashland University, Oberlin Public Library, North Canton Public Library, and Amherst Public Library. The collection is housed in a building of 7,700 square feet accommodating 77 patrons and had a combined operating expense (including personnel) of \$318,008 for fiscal 1995. An average of 1,200 patrons a week visit the library generating approximately 145 reference transactions and an annual circulation of 104,000 materials including inter-library loan. While circulation has remained relatively steady the growth in use of computer based services has dramatically increased with the library's four computers in constant demand. Based upon the above information and the type of collection it was decided that only certain printed materials would be examined and that a desired goal of the study would be to establish a baseline for the development of a formal preservation plan with a special emphasis on a working disaster preparedness program.

#### Staff Preservation Awareness

The first survey was largely conducted through interviews with the library director and available staff members. It was concerned with the state of preservation awareness and the existence of written policies and procedures. Specifically does the library have policies and programs developed either formally or informally on preservation and does a preservation officer exist. It was quickly determined that no written preservation policy exists. Nor is there any mention of preservation issues in the library's mission statement. The lack of a written document which addressed preservation issues of importance to the library was a major drawback. In this respect Herrick Memorial Library is similar to other small to medium public libraries which operate without developed preservation plans. This is not to imply the Director or any of the staff were unaware of critical preservation issues. The Director was in fact keenly aware of how vulnerable her collection was to damage and deterioration. Twelve years ago the children's section suffered a major loss when a water break occurred during the Christmas weekend. With no disaster plan to implement many mistakes were made as well as lessons learned. For example, the staff thought that by turning up the heat it would dry out the damaged items quicker. But this only aggravated the situation since steam heat was used prior to the building's renovation. But like most small library managers she

simply does not have the time or expertise to plan, develop, implement, and manage another program without additional funding for staff training and hours.

This portion of the study also established that preservation practices do exist and are implemented albeit in an informal manner. Materials are examined when they come in. Videos must be brought to the front desk and not placed in the book drop. Interior and exterior cleaning have been contracted out. The inside is cleaned about every two weeks and the exterior windows around twice a year. The Director has in the past diverted funds from the library's travel and conference budget to preservation training seminars. The staff member tasked to conduct in house repairs is thorough and concerned about quality. She avoids whenever possible using repair materials which may introduce secondary damage or accelerate existing problems. Materials are shelved properly though space is now a serious problem. Electronic files are downloaded daily from the main system with the other systems saved an average of once a month.

The Director has no written deselection policy but relies on her experience and knowledge of the collection when weeding materials. Unwritten preservation concepts play a major role in her deciding which materials to retain. She and her staff consider the physical condition of an item as part of the deselection decision process. But without the establishment of a sound preservation plan the library director must rely on her professional knowledge and intuition when making decisions about materials and establishing priorities for the collection during or after an emergency.

The next portion of the study was devoted to an environmental survey. The survey focused upon those physical features which promoted or threatened or had the potential to obstruct the sound preservation of the library's collection. Four specific areas were examined; environment within the building, the exterior and interior of the building, physical security, and storage areas/working areas. The building was renovated in 1986 and conforms with the current state building code for a public structure. The preservation of the original building was a major architectural requirement specified by those who approved the building's construction levy. This consideration proved incompatible with many preservation principles. In 1984 a major water break occurred which flooded the lower level children's library and caused considerable damage. Since that time no major emergency has occurred. The building is located in a central location within the town square and nearly adjacent to the fire department.

### Environmental Survey

The first portion of the survey examined the physical environment which housed the collection. The building's structure became a critical element during the assessment phase since it was reconstructed to emphasize its original historical appearance with no overt consideration for collection preservation. This is very evident since few preservation driven controls were engineered into the remodeled building. For example, only temperature can be controlled a constant levels during the entire day and throughout the year. Humidity cannot be monitored and this makes it difficult to identify when moisture conditions exist which lend themselves to mold growth. This would be critical during a disaster recovery when materials

have been returned from a vendor and must be monitored for spore growth. The following checklist was extracted from a number of sources and was developed to address the small library, which is often located in an older building with few environmental accessories, has been remodeled, or exists as a branch and meets basic building codes for a public use facility.<sup>1</sup>

### **Environmental Controls**

1. Are environmental controls regularly monitored and recorded? No, only the temperature can be monitored. There are four separate thermostats located throughout the building. Each connected to its own furnace.
2. What is the condition of the heating, ventilation, and air conditioning system? Overall the system is in excellent condition. In the past there have been some minor problems with some coolant leakage but it posed no threat to the collection. Moisture does exist in the ducting system as evidenced by corrosion in the ceiling vents.
3. Is there a service contract for the HVAC system and if so are regular service visits scheduled or is it strictly on call when a problem arises? The system is checked in the fall and includes changing filters. The filters are, however, standard household filters and should be changed more frequently. Preservation quality filters have not been considered.
4. Has there been a problems with the system in the past? Only some minor refrigerant leaks.
5. Is the HVAC system separated from the rest of the interior by enclosure? If yes is the room fitted with a fire proof door? The HVAC system is located on the lower level and is separated from the local history collection with a fire resistant wooden door.
6. What is the condition of any exposed electrical insulation? Does the building's amperage meet current projected requirements? The building was designed to accommodate increased electrical demand and has ample outlets to meet current and anticipated needs. No exposed insulation was noted.
7. Are all the windows intact to include sashes and glass? Are they ever opened?  
The windows were permanently sealed with the building's renovation.

8. Is there an automatic sprinkler system and how does it trigger? Are there other fire detection and suppression devices in the building? If so are they properly located? The entire building, including the attic area is fully covered by a fire suppression system. The system itself is periodically checked by a vendor.

9. What is the proximity of windows to the collection? The collection is housed away from the windows which use blinds to filter sunlight. Only the painting and print collection are exposed to indirect western sunlight.

10. How is the effect of sunlight minimized within the building? Blinds are used on the western, northern, and lower eastern facades. The southern wall has no light access at all. It is important to note that while only indirect sunlight penetrates marginally into the collection largely because there is no direct southern exposure this was not a result of planned preservation but rather accidental and in conformity to the building's original design.

11. What kind of artificial lighting is used? Are filters installed? Regular fluorescent lighting is utilized with no filters installed. Incandescent lamps are used over the mezzanines where the painting hang.

12. Are fire extinguishers checked regularly and is there a record of it? Fire extinguishers are located throughout the building and are maintained regularly with supporting documentation.

13. Are particulate filters installed in the HVAC system? No. Standard household filters are used on the building's four furnaces.

### **Physical Structure of the Building**

1. Is there evidence of any damage to the integrity of the roof? Are gutters and drains in good order? There have been roof leaks in the northeast corner of the building and where the water has entered cannot be determined from any examination of the roof. Gutters and drains are in good condition and are clear of debris.

2. What is the condition of the interior and exterior walls? Excellent. No deficiencies noted.

3. Is there any evidence of leaks (water staining etc.)? Yes, on the north east wall within the building's stairwell which is enclosed from the interior housing the collection. This poses no threat to the collection.

In addition, all plumbing, except for the fire suppression system, is housed in the northeast/eastern portion of the building with none exposed to the collection. The faucet in the furnace room leaks.

4. Is the roof and walls insulated? Yes. It cannot be determined, though, to what extent the insulation is fire resistant.
5. Is there an attic? If so, is it clean, uncluttered, and presents no immediate fire hazard? Is a smoke detector present? Is an extinguisher present? The attic presents no fire hazard and is safeguarded with smoke detectors and a suppression system. The threat to the attic and integrity of the inner building is with the roof itself which is sealed with a pitch base with gravel layered over it. The pitch is flammable at a given point and due to its density and the weight of the gravel could threaten the building's interior.
6. Is there evidence of pests? The furnace room is filled with dead bugs around the water heaters and faucets.
7. Is mold present on the walls, ceiling, vents, lavatory? The only mold detected was in the furnace room, especially around the water faucet area.

### **Building Security<sup>2</sup>**

The building is landscaped with trees and bushes along the west side. The north side runs along a street (route 18) and has two entrances, one for the handicapped and the other an entry into the lower level meeting room which houses a limited local history collection. The east side has windows along a narrow alley and a fixed ladder offering easy access to the second story. The south side is adjacent to another building and is considered secure. The building is co-located with both the fire and police department.

1. Are intruder alarms installed? Yes. Each window has a detection strip. Trip lights activated by motion sensors exist within the main patron areas.
2. Is there a central fire alarm and is it connected to the fire department? The building is linked through a monitoring service to the fire and police department. Any sprinkler which is activated triggers the system. Security alarms on each level also trigger that portion of the system. The paintings do not have a separate security system.
3. How many entrances are there to the building and how are they secured? Four. A main entrance, double door solid wood, two side entrances both wood one secured with a metal mesh grating, and a



service door located on the southeast lower level corner. This is the only metal door. All doors are secured with locks only.

4. During periods of closure is the facility routinely checked by the police? The doors are checked daily by the local police who check all the doors along the downtown.

5. Who does the police or fire department contact in case of an emergency? Both departments have a list which list the director as first to contact. There is a descending order of notification if the director cannot be notified. The list is not part of any organized emergency plan.

6. Is there a written or oral procedure for reacting to a physical emergency or break-in? Only a written emergency evacuation plan required by the state for fires and the like exist. All other operating procedures are oral between the director, her staff, and responding agencies. The police will not enter on their own but will call the director first.

7. Is the building insured and is it adequate to replace the structure at today's rates? The insurance is increased on a regular basis but only accounts for inflation and estimated materials costs. There are separate riders for the building, paintings, and electronic equipment. The estimated replacement of the collection is based upon current costs and according to the director represents only a best guess.

8. Is there a lock and key control program? Not only is there no key control program the director cannot account for all the keys. Four staff members have keys as well as the director. The cleaning vendor has one but copies could have been made. In addition, only the police dispatcher has a key which must be secured by the fire department in case of an emergency.

#### **Storage Areas, Reading Areas and Work Stations**

1. What is the general condition of housekeeping? Generally clean but the shelves and lighting are very dusty. This presents a clear fire and static electricity threat and could be easily controlled with increased attention paid to keeping the shelves clean.

2. Are work areas clean and uncluttered? Staff work areas are kept clean and free of drink and food (a staff lounge exist on the lower level) but are very cluttered. This limits staff space with personnel and materials competing for room. The director has her own office which is cramped as well.

3. Are hazardous materials kept in any office cabinets or anywhere outside of an approved locker?

Flammable stain remover was found in a staff locker at the circulation desk. Two boxes of paper materials were found in the stairwell. Lots of boxes and other flammable items are stored in the furnace room as well as in the electrical system room. Both the lawnmower and snow blower located next to the gas main had fuel in their tanks.

4. Are water pipes located near any work station to include computer terminals? No. Based upon their previous experience with a broken water pipe the director had all the plumbing moved away from the collection when the building was renovated.

5. Any evidence of light damage to records, graphic materials, fixtures and other materials around work stations, storage areas, and reading areas. None could be detected though it seems likely the paintings on the second floor mezzanine could have light damage.

6. Any evidence of moisture damage? None except along the northeast wall mentioned earlier.

7. What kinds of shelving exists? Keeping in line with the building's renovation requirements all the shelving, trim, staff areas, tables, stairs etc., are constructed of wood.

8. Is ventilation adequate around shelving and staff records areas? Yes, but only because of state building code requirement which mandate that space exist for handicapped access. If this was not a requirement the stacks would be placed closer as collection expansion increased. Currently, the library collection has reached its limit due to physical space restrictions. Staff areas are equally restricted.

To summarize, the building and its environmental features are typical of any building built to support extensive use by the public. It contains an adequate built-in fire detection and suppression system and provides for rapid isolation of any fire. The building is also electronically linked to the fire and police departments who can rapidly respond to most emergencies within the library. The building, though, presents a number of preservation challenges. The potential fire threat is considerable due to the packed condition of the shelves, high ceilings, and lack of compartmentalization and fire doors internally dividing the collection. These characteristics are essentially unalterable since the thrust of the building's exterior and interior design is to maximize the structure's historical appearance. Other important preservation issues such as dirty shelves and crowded work areas can be easily addressed through increased monitoring of housekeeping and self-policing of staff areas for accumulated materials. Little can be done about the crowded shelves since Herrick Memorial Library, like most small libraries, has little built in expansion potential.

### Condition of the Collection

The third portion of the study was a condition survey of selected portions of the collection. This survey assessed the physical condition and state of repair for the library's holdings and identified any problem areas. Specifically, did any patterns exist? Are there any groups of materials or storage areas which pose a special problem? Like most small to medium public libraries Herrick Library has a greater mix of paperback and hardback materials than larger institutions. It also has little in the way of archival materials and special collections. This library identified three items of value to its collection. The first is the annual yearbook collection of the Wellington High School maintained by the library since 1922. A second valuable collection are ten original paintings and prints by the nineteenth century painter Archibald Willard most remembered for his inspirational Spirit of 76 depicting three revolutionary war soldiers and a painting of the library's most distinguished patron Myron T. Herrick. The last item is an original eleventh edition of the Encyclopedia Britannica which unfortunately has become brittle and the director would like to remove from the stacks and donate to another institution. Based upon the character of the library's holdings four areas were examined; condition of a percentage of hardback books, handling of books and papers, conservation practices, and collection security.

### Condition of Selected Materials

Hardbound books from four areas were selected for a condition inspection.<sup>3</sup> This examination looked at the level of present acidification and overall physical condition of each item. Acidification was determined by the extent of migration as presented by page discoloration and the three fold test. Each book was judged in a range which extended from good (no damage/evidence of acidic deterioration) to very damaged and brittle. Physical integrity refers to the level of damage such as twisted spines, separation of different parts of the book, loose pages, and overall sturdiness. Every tenth hardback book was inspected from each of the three areas of literature, history, and biography. Every third edition of the Wellington High School's Annual was also examined. Paperbacks of all kinds, children's literature, periodicals, and popular fiction were deliberately avoided as categories due to their short shelf life. The earliest book inspected dated from 1878 the latest 1995.

The results of the conditional survey are outlined below:

Period	<u>Acidic Condition/(Physical Integrity)</u>				
	Good	Mild	Moderate	Advanced	Brittle
1878-1900	0	0	1(1)	1(1)	5(5)
1900-1930	0	8(5)	10(7)	8(6)	7(7)
1940-1950	2	8(3)	4(2)	0	2(2)

1950-1960	7(3)	10(5)	2(2)	1(1)	1(1)
1960-1970	13(4)	16(6)	2(2)	0	0
1970-1980	12(3)	13(5)	3(3)	0	0
1980-1995	28(6)	8(3)	6(3)	0	0
<hr/>					
Total	62 (15)	63(27)	28(20)	10(8)	15(15)

In summary 178 books were examined of which 47% show obvious evidence of damage or deterioration. This number would have been higher if an acid pen had also be used during the condition inspection. It must be pointed out that the collection is constantly weeded by the staff so many materials found in other libraries have been possibly already weeded out of the Herrick Library collection. A similar study conducted at a library compatible with Wellington's would probably show a higher rate of deterioration within the collection. Many of the physically damaged materials had twisted spines which is a consequence of the limited shelf space. Books are very tightly packed into the stacks. This condition also contributes to the high number of materials observed which have been grabbed by the top of the spine and pulled out. On a number of occasions patrons were observed removing books in this manner but had to pull hard because of how tight the materials tight packing. The high school annuals are structurally sound with the older volumes shown signs of acidification.

#### Handling of Books and Papers<sup>4</sup>

1. Are printed materials shelved correctly based on size? Yes. All oversized books were correctly placed upon the shelves or where placed in designated shelving for oversized books.
2. Are there different shelves to accommodate standard, oversize, and flat storage requirements? Shelving exist for all the above except that it must be noted there is not enough shelf space to support the collection regardless of size. This physical limitation is the primary factor for initiating periodic deselection of items.
3. How is material placed upon upper shelves retrieved? Stools are conveniently located within the stack areas though on a number of occasions patrons were observed jumping up and grabbing books along the top rows.
4. What kinds of bookends are used. Most shelves have a free standing book end with baked enamel coating. Few hanging wire bookends were observed.

5. Is there sufficient space for expansion within existing shelves? Absolutely not. The mezzanine areas offer the only space available for expansion but design constraints do not support hardback books and shelving. Some paperbacks have been located on the southern mezzanine but this distracts from the paintings and is considered undesirable by the director and patrons.
6. Does the library possess extra floor space for shelf expansion? Floor space is now at capacity due to the requirement to maintain access for the handicapped. This limitation and impediment to collection development was not considered when the building was renovated.
7. How is book overflow and items awaiting return to the stacks stored? On book trucks and heavy duty carts.
8. Are book trucks present? Yes, though it could not be determined if they existed in sufficient quantities.
9. Are book marks available with important library preservation information on them? No. The library has made some of its bookmarks in the past but now uses commercially made bookmarks encouraging reading etc..
10. Is there information on how to correctly use the photo-copy machine? No. The inspection of many newer materials showed spine damage due to repeated improper photo-copy technique.
11. Are books awaiting inter-library loan and the binder properly tied together? Yes. The books are kept separate from other materials. The binder prepares the books for transportation. Interlibrary loan materials are placed in mailing pouches and sealed with staples.
12. How are books stored? Prior to entry into the on-line system books are stored on shelves in the main staff area. Some are also stored on book trucks. Other materials are stored on book trucks prior to shelving. Damaged books are shelved as is with no encapsulation.
13. Are stored items housed in acid free containers? No. Stored materials are in a variety of box containers from packing boxes to grocery containers.
14. Does adequate space exist between stacks and is there good air circulation between them? Yes but as stated earlier existing space will not accommodate any more expansion.

15. Construction materials of shelving? With the exception of some shelving in the children's section and in a few other areas the vast majority of shelving is wood.

### Conservation Practices

1. What materials are repaired in-house? Only a limited number of items are repaired within the library. They are mostly books, both paper and hardbound, and periodicals. An examination of the items used for repair showed mostly acceptable materials.<sup>5</sup> The majority are Gaylord products. One individual who has had some limited conservation training in the past repairs the damaged items. In-house repairs consist of tipping in loose pages, resewing some items usually older materials or periodicals, recasing spines with Gaylord pre-glued recasing leather, page repairs, and some limited repairs done to the spine backs of damaged books.
2. Criteria for repair of damaged items? When does it go to a binder? The director's policy for repair is based upon frequency the item is used, its replacement costs, and its age. Generally if an item is checked out less than twice a year and is damaged it probably will be minimally repaired in-house and returned to the stacks or possibly become a candidate for weeding. If the replacement costs of an items is high and it is considered at that time to be important to the collection then it will be sent to the binder for repair.
3. Is there a bindery contract and how often is it reviewed? The bindery contract is self-renewing and while the quality of the work is acceptable to the director few specifications exist within the contract. Recently the binder has increased the number of a minimum order which means materials sit on the outbound shelf longer. This increase is not addressed in the bindery contract.
4. Does the insurance program cover both the building and its contents? No. Separate riders exist for both areas.
5. Is the insurance program reviewed on a pre-determined basis? The insurance program is renewed annually.
6. How are electronic, microfilmed, and photographic materials stored and cared for? For example are compact disks and microfilm cleaned on a regular basis? Microfilm is not cleaned at all nor are the few photos which exist in the collection. This is important since the director is seeking a grant to establish a local history photo collection. Compact disks, though, are checked and cleaned by the staff as they are returned through the circulation desk.

7. Does the staff check incoming materials for damage? All materials returned through circulation are immediately checked for obvious damage. Damaged items are then shown to the director or the individual designated for materials repairs for evaluation and disposition.

8. Are rubber bands, self-stick notes, paper clips etc., used by the staff on collection materials?

Yes but mostly on routine administrative materials. Few collection items in the staff work areas had any paper clips or rubber bands around them. Self stick notes were found on a larger percentage of materials than other items.

9. Are waste paper baskets located throughout the library? Baskets are abundant and were found to be kept emptied at all times though they tended to fill quickly after school let out.

10. Is food and drink evident in the library to include the staff work areas? No. This is strictly enforced by the library director and the staff.

11. Is there a priority ranking of materials for conservation treatment. The same criteria exists for most items considered for conservation treatment as is utilized for whether an item goes to the bindery. Ease of replacement is one other important factor the director mentioned when this issue was specifically addressed.

12. Does a written disaster plan exist? No. The director when asked what would her collection priorities be in case of an emergency could not come up with what would be saved first, second, and so forth. It was only after discussing this issue that she identified what her collection priorities were. Initially when the issue of a written disaster plan was advanced she assumed it meant the disaster evacuation plan for people and not the collection.

#### Collection Security<sup>6</sup>

1. Is a security gate used? At this time it is not only not cost effective to install a gate but also architectural considerations dictate against any barrier system which distracts from the interior's appearance. The lobby area is also limited. The director did indicate if the rate of theft continues to escalate along its current upward curve the cost of loss may exceed the cost of equipment and at that time she will reconsider a security gate.

2. Is there a pattern to theft within the collection? Young adult paperbacks disappear regularly as do materials dealing with sex and rock and roll. Junior high students are the most likely to be involved in

theft though on occasion adults pilfering stacks of selected materials are encountered. The library director discusses pattern thefts regularly with other libraries in the area.

3. Can windows be opened quickly from inside to pass materials out? This includes the bathrooms.

No. The building is secure from this kind of theft although the paintings could be passed quickly through a broken window. Bathrooms are a convenient place, however, to hide materials inside of cloths and bookbags.

4. Has there been any evidence of employee security violations in the past? i.e., taking out materials without checking them out, theft, etc.? None. The library has a policy where staff can exercise first rights to all new materials before allowing access to patrons.

5. Are complaints about missing items noted and recorded? Missing items are noted immediately and the library's policy is to list them as officially missing that working day. This list is reviewed monthly.

Patterns are quickly recognized since most items are stolen by subject/author two to three at a time. At the Herrick Library the adult biography section has been found to be a favorite hiding place for missing materials.

6. Can the staff easily monitor activities within the stacks and in open areas from their work stations?

Where are the hidden areas within the library? The staff can monitor most of the 1st floor from their work stations. The hidden areas tend to be the stack area adjacent to the copy machine, the reference area and main computer terminals and the entire upper floor stack areas. No mirrors were noted.

7. Has the book drop ever been vandalized? Yes, but it was considered minor. The larger problem is with the deliberate spillage of food and drinks into the book drop which the spill tray cannot contain.

8. Has any other part of the library ever been vandalized? No. Some graffiti on the walls as well as on or within some of the collection's materials.

9. Does landscaping obscure possible entry points into the library or provide a place to drop materials from within the library? Yes but such a scenario is unlikely since the windows are sealed.

10. Is there a silent alarm connecting the library and police? This became an important consideration due to small staff presence especially at night and on weekends. There is a silent alarm located at the circulation desk which is activated by a digital code from a keypad. The code alerts the police to what kind of activity or threat exists.



## Preservation Survey Summary

The preservation assessment concluded that the Herrick Memorial Library is in better condition than many other similar size facilities though this is more a result of the recent renovation rather than an aggressive preservation policy. It was found that the staff does routinely perform many preservation procedures though without the benefit of a written program. The Director is very knowledgeable about the collection and its physical condition. She is also very aware of the challenges which exist in implementing a sound preservation program at a small library. While much of the collection self weeds on a regular basis, it was recognized that the remaining materials would have to be carefully monitored for their physical condition and every effort exerted towards their continued viability since they do represent the core of the library's collection. The special collection of paintings and selected historical artifacts do pose additional preservation challenges for the staff and would be addressed in a written preservation plan. Based upon this initial preservation assessment the library director determined that given available staff and financial resources the best course of action would be to develop a low cost disaster response plan which could be quickly implemented.<sup>7</sup> Once this was accomplished a follow on preservation plan could later be later developed which would address collection preservation and conservation practices. With the conclusion of the study the director was much more knowledgeable about the condition of the collection and the steps necessary for organizing and implementing a preservation plan tailored to the library. The valuable paintings and historic portions of the collection have been identified as critical elements and have been deemed preservation priorities in case of an emergency. Important training requirements have also been singled out for future action to include increased staff awareness and training in preservation procedures.

## DISASTER PREPAREDNESS PLAN

The Herrick Memorial Library Disaster Preparedness Plan has been developed to provide a step by step guide in the assessment, prevention, and response by library staff to any event which may damage or threaten to damage the library, its patrons, or any portion of the collection. The knowledge of what to do and not do prior to or during/after a disaster will contribute to the enhanced safety of staff and patrons, lessen damage, and permit the rapid organized implementation of recovery operations. Each member of the Disaster Response Team will keep one copy of the plan at home. Additionally, critical support agencies such as the Wellington Fire Department and organizations/commercial establishments which will support recovery operations will also receive a copy of the this plan. This disaster response guide will be reviewed twice annually by the library director and disaster response officer to ensure changes in policies, personnel, supply sources, etc. are annotated in the plan. All staff members will review this plan semi-annually as part of disaster awareness training which will be conducted semi-annually.

### 1. Emergency telephone numbers

- (a) 911
- (b) Police: 647-2244
- (c) Fire: 647-2245

### 2. Key Personnel (chain of responsibility)

#### 1. *Library Director*: Pat Lindley, 647-3051

**Duties and Responsibilities:** The library director ensures the overall response effort is coordinated with other agencies responding to the disaster and ensures the logistic response supports the efforts of the Disaster Response Coordinator. This includes volunteer groups/individuals, commercial establishments, local restaurants supplying food etc. to work crews, transportation assets, and other libraries which may offer their help. The Director is the primary communicator with the public and sole releaser of information. The Director is also concerned with media relations, contacting the supporting insurance company, vendors, and state/local officials with an interest in recovery operations. The Director also initiates the activation and organization of the alternate library site if required as well as acts on all personnel, budget, and collection decisions which arise during the salvage operation.<sup>8</sup>

#### 2. *Disaster Response Coordinator*: Gloria Dybo, 647-5574

**Duties and Responsibilities:** The Response Coordinator is responsible for the on-site management of the recovery operation. The Response Coordinator assembles and coordinates work crews and ensures recovery operations follow priorities established by the Director within the overall disaster plan or modified to meet the unique requirement of the disaster. The Response Coordinator also ensures that

damaged items are recorded and a log is maintained of damaged items, the extent of damage and their location. The Response Coordinator conducts the initial damage assessment, identifies, in consultation with the Library Director and Preservation/Conservation Officer, where the main recovery effort will commence, assembles supplies needed to support the work crew (to include food etc.), manages a pay budget for recovery teams if funding is available, photographs damage, and lastly trains work crews as needed.

**3. Preservation/Conservation Officer:** Gloria Dybo, 647-5574

**Duties and Responsibilities:** The Preservation and Conservation Officer manages the library's on-going preservation effort and is responsible for ensuring that routine disaster preparedness training is made available to staff semi-annually. This officer is also responsible for monthly facility inspections and keeping the Director and Disaster Response Coordinator informed of any issues which may impact upon the library's disaster response plan. During recovery operations the Preservation/Conservation Officer conducts materials triage, manages the individual recovery of materials, oversees drying and repair of materials, ensures repair supplies meet current and anticipated needs, and identifies to the Response Coordinator items which cannot be repaired in-house. The Preservation Officer will also ensure that items marked for vendor support will be properly stored, packaged, inventoried, and in general prepared in accordance with the vendors requirements.

**4. Team Recorder/cataloger:** \_\_\_\_\_

**Duties and Responsibilities:** The team recorder provides for inventory control of all damaged items, what container they are in, their condition, and their disposition. The team recorder reports directly to the Disaster Response Coordinator and coordinates with the Preservation/Conservation Officer during the cataloging and inventory preparation of materials which will require vendor support.

**5. Disaster Recovery Team:**

**Duties and Responsibilities:** Generally, the Disaster Recovery Team's activities at a minimum include;<sup>9</sup> routine procedures ensuring security and fire systems work, evaluating and documenting damage, training staff, contacting support groups who will provide a service i.e., freezer storage space for water damaged items, gathering and accounting for supplies, contacting freezing and/or drying facilities, setting up in-house drying areas, packing and transporting materials to an alternate temporary library site, repairing damaged items, dealing with vendors, general clean-up, recurrent inspections for mold etc., on items returned to the stacks, and finally keeping the public informed.

<b>e. <u>Recovery team members:</u></b>	<b><u>Phone</u></b>	<b><u>Library Position</u></b>
1. Jodie Holben	647-2799	
2. Jane Snodgrass	647-3009	
3. Kay Knight	647-6774	

<b><u>Recovery Team Members</u></b>	<b><u>Phone</u></b>	<b><u>Library Position</u></b>
-------------------------------------	---------------------	--------------------------------

- |                   |          |
|-------------------|----------|
| 4. Fran Zacharias | 647-2931 |
| 5. Bonnie Husman  | 355-4507 |
| 6. Pat Hutchins   | 647-3685 |

**f. On-call volunteer recovery members/groups**

**Home/Work Phone**

1. Wellington Key Club (Mr. Kim Meyers, Advisor, work: 323-5020)
2. Friends of the Library (Marsha Coates, home: 647-4042)
3. Dave Schoonover (High School, home: 647-4763)

**3. Additional Support personnel/organizations which can provide services during an emergency**

**a. State Preservation/Conservation Consultant:**

The State Library of Ohio  
 65 S. Front Street  
 Columbus, OH, 43266  
 1 800 686-1533

**b. Commercial Recovery/Consultant service:**

BMS Catastrophe  
 303 Arthur Street  
 Ft. Worth, TX 76107  
 817 332-2770  
 817 332-6728 (fax)  
 800 433-2940 (24hr hotline)

Steamatics North Coast  
 4530 Renaissance Pkwy  
 Warrensville Heights, OH 44128  
 Bob Akers  
 216 831-1995

**c. Photographer: Pat Smith, Children's Librarian (Herrick Memorial Library)**

**d. Insurance company:**

Sponseller-Peterson Agency  
 149 Herrick Ave  
 Wellington, OH 44090  
 Bill Schlather: 647-3313

**e. Legal advisor:**

Gregory White  
 Lorain County Prosecutor  
 Loraine County Courthouse  
 647-2351

Frank Ashbaugh  
 Wellington, OH

110 Herrick Ave West  
Wellington, OH 44090  
647-4219

**f. Art conservationist:**

Banfoey Company  
170 Euclid Ave  
Cleveland, OH (216 621-0178)

**g. Electronic media vendor:**

Gaylord Information Systems  
P.O. Box 4901  
Syracuse, NY 13221  
800 634-6304 x6

**h. Construction firm:**

Jennings and Churella Const. Co. (Brad Koch)  
311 Maple St.  
Wellington, OH 44090 647-3600

**I. Temporary freezer storage sites:**

Sparkle Supermarket  
816 N. Main St.  
Wellington, OH 44090  
Barb O'Keefe  
Manager  
647-2169

Wellington High School  
629 N. Main St  
Wellington, OH 44090  
Greg Backus/Superintendent  
647-3734

**J. Wellington Fire Marshal**

Robert Walker  
647-2101  
647-2245 (Fire Station)

**K. Security Service/Forthfer Security (647-7611)**

**4. Library Staff Directory Tree**

Personnel	primary	alternate	CPR qualified	
	phone #	phone#	yes	no
Dybo, Gloria	647-5574			

Holben, Jodie	647-2799
Husman, Bonnie	355-4507
Hutchins, Pat	647- 3685
Knight, Kay	647-6774
Lindley, Pat	647-3051
Luthy, Nancy	647-3484
Norton, Charlotte	647-6562
Shott, Barb	647-3631
Snodgrass, Jane	647-3009
Strubbe, Pat and	419 736-2416
Edwards, Laurel	
Zacharias, Fran	647-2931

##### 5. Basic Principles of Disaster Management:

Disaster can occur at any time and the first concern is for the safety of all personnel within the building. Escape routes should be clearly marked and procedures for the evacuation of the building well rehearsed among staff. The evacuation procedures should be clear and simple with sufficient signage to enable patrons to quickly evacuate themselves with minimal staff instruction. Practice drills will be practiced as outlined in the emergency evacuation procedure. The majority of library disasters occur during periods when the building is unoccupied, weekends, nights, holidays, and early morning. If a disaster has occurred during such periods staff is restricted from entering the building for assessment purposes until authority has been granted by the Fire Marshall or civil authority in charge. Staff will normally receive permission from the Library Director or Disaster Response Coordinator. The majority of disasters will result in water damaged materials and mold will develop within forty eight to seventy two hours if a warm humid environment exists. It is imperative, therefore, that staff thoroughly understand the basics of disaster management and their individual roles during recovery.

##### **Do's and Dont's in Disaster Response\***

Seek the advice and help of book and paper conservators with experience in salvaging water-damaged materials as soon as possible.

Turn off heat and create free circulation of air.

Keep fans and air-conditioning on day and night and use dehumidifiers and insure a constant flow of air is necessary to reduce the threat of mold.

Brief each worker carefully before salvage operations begin, giving full information on the dangers of proceeding except as directed. Emphasize the seriousness of timing and the priorities and aims of the whole operation. Instruct workers on means of recognizing manuscripts, materials with water-soluble components, leather and vellum bindings, materials printed on coated paper stock, and photographic materials.

Do not allow workers to attempt restoration of any items on site. This was a common error in the first 10 days after the Florence flood, when rare and valuable leather and vellum-bound volumes were subjected to scrubbing and processing to remove mud. This resulted in driving mud into the interstices of leather, vellum, cloth, and paper, caused extensive damage to the

volumes, and made the later work of restoration more difficult, time consuming, and extremely costly.)

Carry out all cleaning operations, whether outside the building or in controlled environment rooms, by washing gently with fresh, cold running water and soft cellulose sponges to aid in the release of mud and filth. Use sponges in a dabbing motion; do not rub. These instructions do not apply to materials with water-soluble components. Such materials should be frozen as quickly as possible.

Do not attempt to open a wet book. (Wet paper is very weak and will tear at a touch. One tear costs at least one dollar to mend!) Hold a book firmly closed when cleaned, especially when washing or sponging. A closed book is highly resistant to impregnation and damage.

Do not attempt to remove mud by sponging. Mud is best removed from clothes when dry; this is also true of library materials.

Do not remove covers from books, as they will help to support the books during drying. When partially dry, books may be hung over nylon lines to finish drying. Do not hang books from lines while they are very wet because the weight will cause damage to the inside folds of the sections.

Do not press books and documents when they are water soaked. This can force mud into the paper and subject the materials to stresses which will damage their structures.

Use soft pencils for making notes on slips of paper but do not attempt to write on wet paper or other artifacts.

Clean, white blotter paper, white paper towels, strong toilet paper, and unprinted newsprint may be used for interleaving in the drying process. When nothing better is available, all but the color sections of printed newspapers may be used. Care must be taken to avoid rubbing the inked surface of the newspaper over the material being dried; otherwise some offsetting of the ink may occur.

Under no circumstances should newly dried materials be packed in boxes and left without attention for more than a few days.

Do not use bleaches, detergents, water-soluble fungicides, wire staples, paper or bulldog clips, adhesive tape, or adhesives of any kind. Never use felt-tipped fiber or ballpoint pens or any marking device on wet paper.

Never use colored blotting paper or colored paper of any kind to dry books and other documents.

Used and damp interleaving sheets should not be reused.

Frequent changing of interleaving material is much more effective than allowing large numbers of sheets to remain in place for extended periods.

Newsprint should not be left in books after drying is complete.

A good grade of paper towel is more effective than newsprint, but the cost is much greater.

\* Extracted from "Procedures for Salvage of Water Damaged Library Materials  
<http://www.nara.gov/nara/preserva>

**1. Upon entering the building or affected portion of the collection:**

- a. Enter only areas declared safe

- d. Do not attempt to write or make notes on any wet materials. They will tear.
- e. Do not separate books etc., that are stuck together.
- f. Never use any kind of adhesives, paper clips, staples, or various household chemicals on wet materials. The moisture in the affected materials will rapidly react and compound existing damage.
- g. Avoid any packing materials which can bleed colors onto damaged items. This too will cause chemical reactions.
- h. Properly pack damp or recently dried materials materials to minimize mold development.
- i. Never leave any wet materials for longer than forty eight hour. If you cannot get to them within that period place the materials in freezer storage. The quicker the better.

2. Once an area has been declared safe the Disaster Response Officer and Preservation Conservation officer will conduct a damage assessment. During this assessment they will evaluate the extent of the damage, what kind of damage has had the most effect i.e., smoke, water, heat, chemical (especially if damage has occurred as a result of general flooding in which oil, fuels. and other contaminants have mixed with flood waters), soot, and mold. The evaluation will document which part/parts of the building/collection have sustained the most of the damage and what types of materials are affected (books, tapes, microforms, computer equipment, compact disks etc.). Based upon collection priorities established by the Director, the initial assessment will determine which items should be addressed first as well as document which critical items have been destroyed. Items which can be salvaged in house and those requiring external support must be identified at this time as well.

It is advisable, for insurance documentation, to photograph as much of the damage at this point.<sup>11</sup> During this assessment period the Library Director should be notifying the insurance company and preparing to initiate various phases of the disaster response plan which concern vendors, support agencies, volunteer groups, and alerting commercial sources proving freezer space of possible requirements.

3. The next critical step is to stabilize the collection environment if possible.<sup>12</sup> This is situationally dependent. For example windows which have blow in or out need to be covered. Holes in the roof covered with plastic. Standing pools of water should be removed as quickly as possible. Regardless of the nature of the emergency it is imperative that the environment be stabilized to prevent the growth of mold. This is best achieved at a relative temperature of 62-65 degrees and 50% humidity. Do not attempt to speed of the drying of materials by turning up the heat. This will only accelerate the development of mold. Use fans to circulate humid air in the damaged area. All standing water presents a danger area and should be first cleared by the Fire Marshall. The recovery process will be facilitated quickly if the following equipment is available:



a. Portable industrial grade sump pumps (location) \_\_\_\_\_

b. Minimum 3K generator if power failure occurs. (location) \_\_\_\_\_

c. Large and small fans to keep air circulating. (location) \_\_\_\_\_

d. Dehumidifiers if working around a small area. Most dehumidifiers can only handle approximately 500 square feet and will not help in areas of lower temperatures.

(location) \_\_\_\_\_

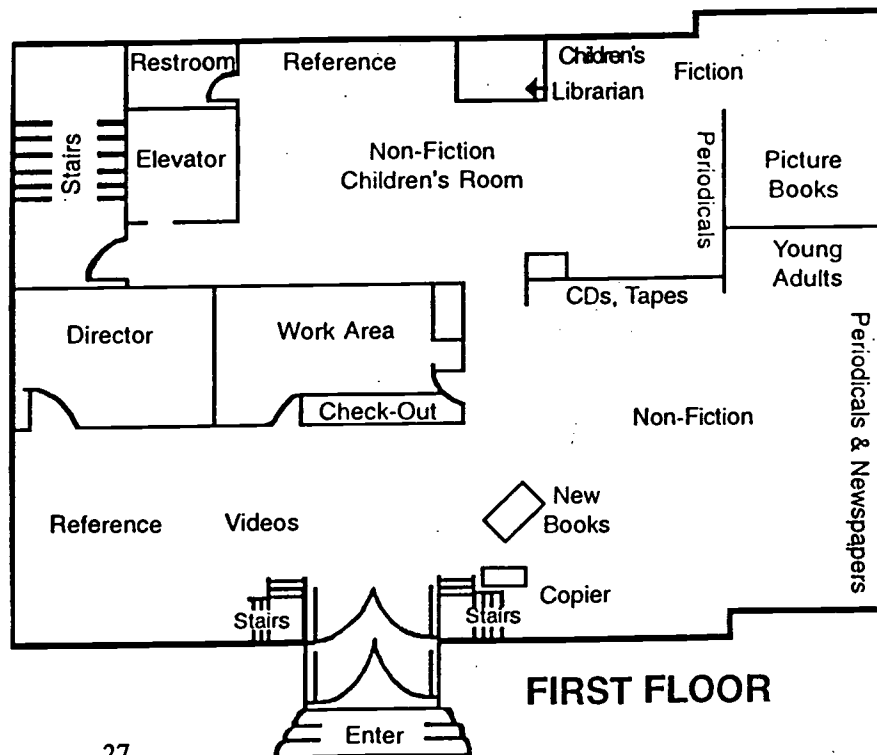
4. Once the initial assessment has determined the extent of damage and the environment is in the process of being stabilized fully activate the in-house recovery team. The Disaster Response Coordinator will organize the recovery effort and direct all recovery efforts to include the work of volunteers. It is the responsibility of the Response Coordinator to develop and manage the recovery plan as well as ensure that the area is secured from outside spectators.

5. Once the affected area has been stabilized and the affected materials removed the area must be restored as much as possible to its original condition. Floors, walls, surviving carpets, furniture, and all equipment must be thoroughly cleaned and treated with a fungicide. All surrounding areas co-located to the damaged areas must be inspected periodically for mold development. Once the damaged area has been returned to serviceability undamaged and recovered materials may be reinstalled. It is recommended that items in this area be periodically inspected as part of the preservation program.<sup>13</sup>

## 6. Floor plans

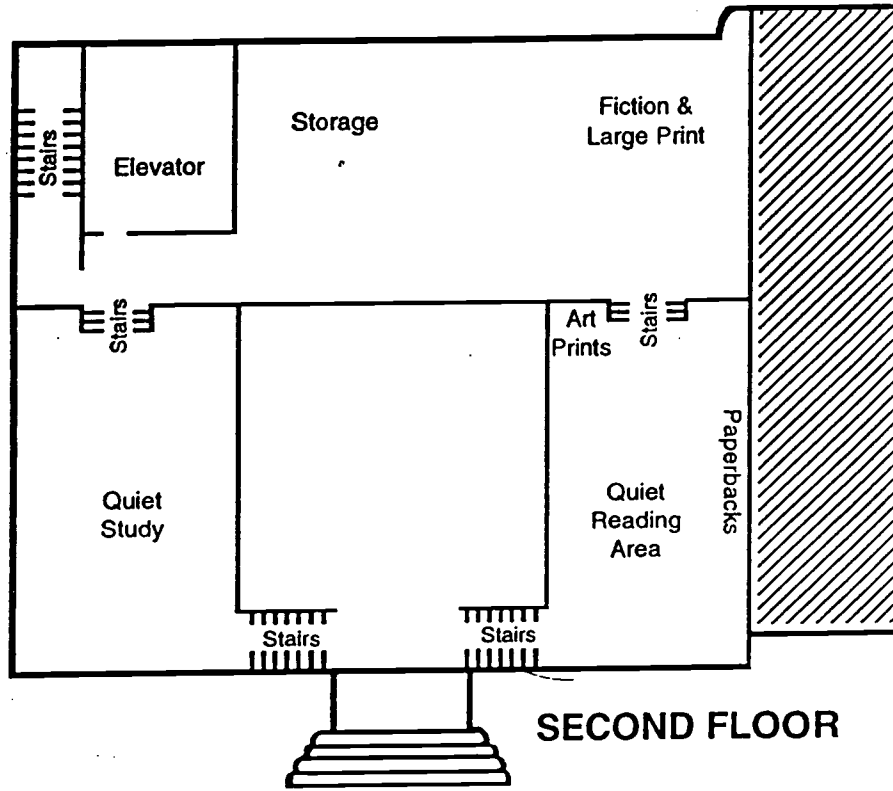
### a. 1st Floor

1. Fire extinguisher locations
2. First Aid kit
3. Disaster Kit
4. Emergency escape routes
5. Emergency lighting locations



b. Second floor

1. Fire extinguisher locations
2. First Aid Kit
3. Disaster Kit
4. Emergency escape routes
5. Emergency lighting locations



**7. Priority lists of materials to be salvaged in each area of the library**

a. **Lower level**

Back up-tapes and disks  
Local history storage/artifacts/papers  
Financial records

b. **First Floor**

Reference materials in glass case  
Computer equipment  
Computer disks  
Hardbound books

c. **Second Floor**

Paintings  
Original prints

**Criteria for damaged items:**

1. *Can the item be replaced if it cannot be salvaged?*
2. *Would the cost of replacement be less or more than the cost of restoration? (freeze drying can sometimes exceed the cost of item replacement)*
3. *How important is the item to the collection?*
4. *Is the item available elsewhere?*

8. The majority of damage incurred by collections involves water saturated materials. This section covers the handling of such materials and includes paper based items, microforms, Audio Disks (records), Magnetic based tapes and disks, photographic materials, and various art forms and plastic media (paintings, ceramics, metals, and wood)

Magnetic based tapes and disks, photographic materials, and various art forms and plastic media (paintings, ceramics, metals, and wood).<sup>14</sup>

**1. WATER DAMAGED MATERIALS:** The following procedures will be used when handling water damaged materials. The steps taken are dependent upon the type of recovery method selected.

a. Volumes which will be frozen prior to treatment: Freezing wet materials will stabilize them and inhibit the development of mold as well as prevent further deterioration. Books may be kept in this state for an extended period of time allowing the library staff to plan a course of action. Normally, freezing materials is a precursor to recovery techniques such as freeze drying or air-drying. Temperature for freezing materials is best achieved around 15 degrees since this will contribute rapidly to the drying out of wet materials. If the outside temperature is below 15 degrees place the materials in a secure area. Any materials placed outside should be covered with plastic or tarps. Freezing materials also helps reduce smoke odors.

b. Procedure for freezing materials:

**Evacuate Materials**<sup>15</sup>

1. Remove all items from the floors and spaces between the stacks.
2. Start with the most saturated items. Depending upon the water source these materials may be found usually on either the top or bottom shelves.
3. Any sludge, dirt, or mold should be removed as quickly as possible prior to freezing. Soap and warm water should be used. Avoid all industrial cleaners. If time or personnel do not permit this initial cleaning the items can still be frozen but will still require a thorough cleaning as a step in the recovery process. Materials contaminated with sludge must be cleaned immediately since it is difficult to clean such damage once the sludge has dried.
4. To the greatest extent possible pack all materials on location. This allows for proper procedure implementation and ensures quality control is maintained. In addition, on site packing permits increased inventory control and identification of items.
5. Ensure that record keeping is as accurate as possible.

## Pack Materials<sup>16</sup>

1. Strive to maintain shelf list sequence when removing materials.
  2. Place freezer paper around each volume with the waxed side against the material. The item should be placed spine down in a plastic crate. (milk crates are ideal) Recover all items from the affected area as they are found. Never try to open or close wet volumes.
  3. Each crate should be packed so materials do not roll around or are otherwise subjected to damage. Materials should not be packed on top of each other and should be no deeper than a single layer. Books found swollen open must also be wrapped in freezer paper and can be placed on top of a single layer of packaged items.
  4. Books and periodicals which cannot be effortlessly separated from each other should be packed as a single unit.
- b. Procedure for preparing bound materials for air drying

## Inventory Control<sup>17</sup>

1. The Team Recorder/Cataloger will label each crate with the name of the library, Herrick Memorial Library, container number, and date/time.
2. The above information will be kept on a separate document and will include additional information such as call numbers and number of items packed.
3. Maintain a master list as well as separate lists for containers sent to different locations for freezing. It is critical that the location for each crate as well as its contents is maintained.
4. For insurance purposes maintain a list of damaged items (torn covers, soot, fire marks etc.) and items which are disposed of because they either do not meet recovery criteria established by the Director or are destroyed.<sup>18</sup>

## 2. Movement to Storage/Freezer Site

1. Accountability of packed crates and contents must be maintained throughout the shipment process.
2. If possible assign someone to be responsible for the transportation phase of recovery.
3. Materials must be moved as quickly as possible, within forty eight hours. If not, they can be placed in refrigerated rooms or trucks until local freezer space is available.

### **Damaged bound volumes which will be air-dried.**

#### **a. Cleaning Procedure**

1. Keep the material as tightly closed as possible without causing further damage and rinse it under clean, cool, running water.
2. Avoid abrasive cloths and with a sponge or soft cotton rag gently remove as much of the mud and debris by gently dabbing. Avoid rubbing and sponging the pages in order to minimize the amount of mud etc., from being forced into the spine or pages.
3. Gently squeeze the damaged item to remove excess water and restore some of the books shape.

#### **b. Avoid washing the following items:**

1. works of art on any kind of paper
2. fragile or brittle items
3. manuscripts
4. open/swollen volumes
5. anything containing suspected or know water soluble colors
6. bindings which contain leather

### **B. Water saturated materials<sup>19</sup>**

1. Water saturated bound volumes should never be opened. The soaked paper will tear easily.
2. Pages have a tendency to hang within the binding when a volume is shelved upright therefor volumes should be placed on their heads, preferably over some kind of absorbent material such as paper towels, cotton towels (white), or baby diapers. Plastic sheeting should be placed under the paper toweling or unprinted newsprint to protect table tops. Turn the volumes right side up when changing the paper beneath them. Their position should be reversed each time the paper is changed and the wet paper removed from the area.
3. A damaged volume may be further supported by opening the covers slightly.
4. To prevent staining from dyes aluminum foil may be placed between the cover and the endleaf.

5. When it can be determined that most of the water has drained from an item it may then be treated as a damp volume.

6. During this and the following steps maintain good air circulation with fans and attempt to remove as much moisture with dehumidifiers as possible.

### **C. Damp volumes**

1. Carefully open the damaged book no more than 20 to 30 degrees.  
2. Maintain the volume in an upright position.  
3. Approximately every forty to fifty pages place interleaving sheets. Avoid creating any distortion to the affected volume.

4. Frequently replace the sheets as water continue to be absorbed. Avoid reusing sheets unless they have been impregnated with a fungicide such as Ortho-Phenyl Phenol (O-PP). To achieve the correct mixture of O-PP, mix one pound of O-PP to one gallon of acetone or ethanol (either chemical can be easily purchased from any large hardware store or industrial supply outlet. Whenever using any of these chemicals wear rubber gloves and a mask. Follow all manufacturer's instructions prior to beginning treatment.

5. As the moisture is absorbed by the interleaving sheets remove and replace the paper underneath the damaged volumes.

### **D. Slightly damp volumes or volumes with only wet edges.**

1. Volumes should be stood on their heads and slightly fanned open. Paperback books can be stacked to support each other as long as some kind of neutral barrier such as plastic (ball point pen shells with the ink cartridge removed) or Styrofoam can be used. Avoid anything made of wood or metal since they will accelerate acidosis of the paper.

2. Maintain good to enhanced air circulation.

3. When relatively dry the affected volumes may be laid flat and weights placed upon them to minimize the effects of swelling and distortion. Volumes which are still noticeably wet must be returned for continued air drying.

4. Larger paperback materials and bound volumes which weigh less than six pounds may be hung on fishing line to accelerate drying time.

### **3. Coated stock materials (most magazines and popular journals)**

It is very difficult to save most coated stock materials once they are saturated. Once the pages have adhered together it is, in most cases, impossible to open the pages. If the decision is made to attempt to save such materials it will be very time consuming and detract from the recovery of other items. Air drying is the preferred method since freeze drying is rarely successful.

1. Do not casually handle wet coated stock materials as the print will slide off the wet page if rubbed.

2. Never allow the material to dry. Place the items in a bucket or other holding container and keep them submerged until they can be worked on.

3. Each page must be separated and interleaved.

4. Air dry as with other bound volumes.

#### 4. Unbound materials, papers, letters, archival materials

This is a time consuming process and is very labor intensive but may be necessary if the library has developed an important collection, regardless of size, of historically important letters, town records, loose leaf/bound diaries, etc.

1. Freeze all items in the state they are found.

2. Do not remove items from file cabinet drawers, document protectors, or folders.

3. It is not necessary to drain record containers by turning them over. Drain all water from the bottom even if it means drilling/punching a hole through the bottom of the container.

4. In order to separate each of the saturated sheets for air drying it will be necessary to place a sheet of polyester film on top of a stack of wet, unbound papers (or the first page of a bound volume such as a diary).

5. Take a bone folder and gently rub the film over the affected sheet. The resulting friction will cause the wet paper to adhere to the film.

6. The top sheet is then gently peeled back and placed on a piece of polyester web. non-woven interfacing, such as Pellon, is often recommended.

7. Remove the polyester film and place another piece of polyester web on top of the wet sheet.

8. Repeat the entire process interleaving each wet sheet with polyester web.

9. If necessary materials may be frozen for later recovery at this time.

10. Air-dry the sheets by placing them on drying racks, absorbent color neutral materials, and maintain good air circulation.

11. Once the materials have become relatively dry they may be placed between two sheets of absorbent paper and pressed gently until the remaining moisture is absorbed and the sheet returned to a flat state. This may be achieved using weighted objects such as books etc. Place a water resistant color free non wood barrier between the item and any weighted objects.

#### 5. Non-book materials

A. Photographic prints, slides, negatives, and film): Photographic materials should not be allowed dry untreated after they become wet, as they will stick together or to whatever they are contained in. Like items constructed of coated stock, photographic materials will shed their image or the emulsion which adheres them to photograph's paper stock.<sup>20</sup>

1. Remove all materials as quickly as possible from their containers and wash thoroughly under cold water.



2. Color photographs may be air dried or frozen immediately but expect major deterioration since the colored layers will separate and fade quickly.

3. Other non-color materials may be air dried either flat or on fishing lines. Do not use wooden clothes pins.

4. Items may also be stored temporarily in cold water. The water should be 65 degrees or colder. This will protect and preserve the emulsion. The recommended limit is seventy two hours. Formaldehyde may be added to the water to prevent the gelatin from softening as well as retard mold growth. The suggested ratio is fifteen milliliters to one liter of water (most plastic soda pop bottles today are expressed in metric). The materials may then be washed in cold, clean water after removal from the solution. Black and white film will last up to a maximum of seventy two hours while stored in this solution before the emulsification begins to separate and color film, at best, can be expected to begin emulsification deterioration within forty eight hours.

5. After rinsing, the items should be immediately sealed in polyethylene bags inside of garbage pails and shipped to a photographic recovery facility within twenty four hours.

6. For other items they may be frozen for later recovery but the emulsion may be damaged from the formation of ice crystals. Negatives will adhere to each other upon thawing if they are not first separated before freezing.

#### B. Microforms<sup>21</sup>

1. Silver halide microfilm must be kept underwater as with photographic materials and sent to a vendor for recovery.

a. For Fuji photo film contact .....800 241 7695

b. Eastman Kodak....312 954 6000

2. Vessicular and diazo microfilm.

a. Wash off any debris with cold, clean water.

b. Air dry or dab dry with cheese cloth.

3. Microfiche: Treat the same as with vessicular and diazo microfilm.

C. Audio/video tapes, CD ROMS, CD audio and floppy disks: Water is especially damning to any kind of magnetic material.<sup>22</sup> The longer they have been wet, the increased degree of damage. Never attempt to play damaged tapes or disks since they are likely to damage electronic equipment. All magnetic tapes are difficult to recover and should be considered for repurchase if available. If not the following steps are recommended:

1. Open containers and remove the tape or floppy disk.

2. Wash in clean or distilled water.

3. Air dry or dry with cheesecloth and run through a tape cleaner. Thoroughly air dry the internal housing of the tapes container. Do not attempt to accelerate drying time with heated air since this will promote humidity and increase the likelihood of the various media adhering to each other.

D. Records: While not actively collected anymore, audio records remain in many libraries and like other magnetic based mediums can be easily damaged from debris. They are not affected by cleaning with cold clean water but may be affected by rapid changes in humidity and temperature. Warping can occur if the recovery environment promotes such changes. Disks may be dried with cheesecloth or a soft lint free cloth. Careful attention to record jackets is recommended since they will harbor moisture. Since record jackets often contain a great deal of important information they should be recovered using the same techniques as other printed materials.

E. Arts and artifacts: The Herrick Memorial library contains a number of mixed media objects each with its own unique recovery requirements. Most of these items should be turned over to professional conservators for recovery. This is especially true for the library's collection of original paintings. The paintings should be moved rapidly to the vendors recovery site since deterioration will affect not only the various pigments but also the canvas, wooden frames (which will absorb water and swell stretching the canvas) and glass covers over prints.

1. Stone, glass, and ceramics: These items may be air dried naturally. If any of these materials have been corrupted by chemicals, fire retardants, pollution, fuels or solvents, they should be kept wet until a specialist can be consulted.

2. Metals: All metals with the exception of some alloys are susceptible to oxidation, rust. The best treatment is to immediately dry it with a soft absorbent rag. Metal items which are part of a machine, any kind to include watches and cameras, can be washed with clean water and froze until a conservator can be consulted for further treatment.

3. Wood: Wood presents a special problem for the Herrick Memorial Library since much of the interior is constructed of wood. Wood will swell when it absorbs water and consequently warp. This will impact upon much of the collections shelving capacity. Water damaged wooden materials and objects should be treated by a professional conservator.

6. Mold: Mold and mildew will pose a major threat to the library, its physical housing, and the collection for years after any disaster which involves water.<sup>23</sup> Mold can never be completely eliminated and is capable of remaining in a dormant spore stage for years. Immediately after a disaster environmental control must be quickly established to prevent not only mold development on the affected materials but the spread of mold to rest of the collection.

1. Mold can be expected to develop within forty eight hours if the temperature is over seventy five degrees and the humidity sixty percent or greater.

2. To minimize or arrest the spread of mold separate damaged materials as quickly as possible.

3. If mold has begun to appear interleave affected items with absorbent sheets soaked with a fumicide.
4. Mold can be easily removed (though never completely) from materials which have been allowed to dry. The spores may be removed through gently brushing the contaminated area or in some cases vacuumed with a small hand vacuum.
5. If mold is apparent with a large number of materials which have been identified for retention it is recommended that they be sent to a conservation service for fungicidal fogging.
6. During all phases of recovery and later when library operations have returned to normal good air circulation is critical, temperature and humidity monitored, and a program established to periodically examine materials and the facility for mold reemergence.

**7. Smoke and Fire Damage:** All materials damaged by smoke and fire damage will be placed in separate crates for further evaluation. Generally smoke and fire damage, especially from the very high temperatures usually generated in library fires, is irreversible.<sup>24</sup> Attempts to remove fire or smoke damage often increases the level of damage and such restoration within a small library is not recommended. If the director determines some of the damaged materials should be saved, they should be sent to a conservator for further evaluation. Packaging and shipping of such materials should be done per instructions from the vendor.

1. For minor damage, smoke sponges can be used to carefully remove some surface soot and dirt. With specialized smoke damage addressed by:

Zephr Manufacturing  
400 West. 2nd St.  
PO box 71 Sedalia, MO 65302-0071  
816 827 0352 fax 816 827 0713

2. Freezing smoke contaminated materials will sometimes remove some of the smoke odor.

**8. Natural Disasters (Hail damage, high winds, tornadoes etc.):** These types of threats require the same response as a fire. They will require the initiation of the disaster response team if any damage occurs. Typical types of damage will include broken windows, roof damage, damaged gutters, and debris within the building. Because most natural disasters are accompanied by heavy rain, water damage is an additional major concern besides structural damage. In addition, high winds will create projectile damage to both the exterior and interior of the library building with accompanied damage to collection items, equipment etc..

1. Staff personnel on duty should be prepared to quickly respond to hail and high wind threats by ensuring sheet plastic, duct tape, and scissors are at hand to cover any breaks in the windows.

2. After the threat passes immediately conduct both an external and internal inspection to determine if damage has occurred.
3. A contractor should be immediately called if any damage has occurred which cannot be in-house repaired. This is mandatory if any part of the building's structure has been damaged to the point that the environmental integrity of the collection is threatened.

9. **Insects, Vermin, and Dust:** These three problems are present in all libraries to some degree with insects and dust the two most common. Regular inspections of storage areas, stacks, and work areas coupled with good house keeping are key to reducing dust accumulation. Dust should be regularly removed since it carries fungi, mold spores, and bacteria which attack paper. Suppression of insects and rodents should be left to a professional pest control service. During a disaster recovery all of the above pose an extremely heightened threat to both damaged materials and the surviving portions of the collection. Increased pest and rodent vigilance as well as a redoubled housekeeping effort become mandatory during recovery and post recovery activities.

#### 10. EVALUATION OF LOSS

When a flood or fire-damaged collection is covered by insurance, full settlement of a claim cannot be realized until the lost and damaged materials have been listed and their values established. The extent and success of possible restoration must also be determined. In the event that a claim is anticipated as a result of such damage, every item should be salvaged, frozen, and dried. After drying, the affected materials should be shelved in a specially equipped environmental storage area, isolated from the main stacks, and there inspected and monitored over a period of time. Such a policy is the best guarantee of sound judgments by custodians, consultants, and adjusters when they must calculate the degree of loss as a basis for compensation.

#### 11. Inventory of available supplies for emergencies:

<i>item</i>	<i>on hand (y/n)</i>	<i>location</i>
<i>quantity</i>		
library book trucks	_____	
buckets	_____	
mops	_____	

brooms \_\_\_\_\_

sponges \_\_\_\_\_

cotton towels (white) \_\_\_\_\_

*item* *on hand (y/n)* *location* *quantity*

water vacuums \_\_\_\_\_

paper towels \_\_\_\_\_

unprinted newspaper \_\_\_\_\_

freezer paper \_\_\_\_\_

waxed paper \_\_\_\_\_

rolls of blotting paper \_\_\_\_\_

plastic sheeting \_\_\_\_\_

garbage bags \_\_\_\_\_

flashlights \_\_\_\_\_

ladders \_\_\_\_\_

fans \_\_\_\_\_

heavy duty extension cords \_\_\_\_\_

scissors \_\_\_\_\_

duct tape \_\_\_\_\_

jiffy cutters/industrial razors \_\_\_\_\_

12. Locations of off-site equipment and supplies

<i>item</i>	<i>company/point of contact</i>	<i>phone</i>
deep freeze facility	_____	_____
alternate library site	_____	_____
industrial dehumidifiers	_____	_____
drying space	_____	_____
large fans	_____	_____
additional library trucks	_____	_____
plastic cartons	_____	_____
plastic sheeting	_____	_____
refrigerator trucks	_____	_____
unprinted newspaper	_____	_____
wet-dry vacs	_____	_____
sump pump	_____	_____
portable generator	_____	_____
wooden pallets	_____	_____

13. Checklist of most recent building survey ( quarterly ) last survey \_\_\_\_\_

current survey \_\_\_\_\_

**MONTHLY BUILDING SURVEY**

**DATE:** \_\_\_\_\_

	<i>yes</i>	<i>no</i>
a. Locks of windows/doors/sensitive areas.	___	___
b. keys accounted for	___	___
c. Emergency numbers posted at critical points	___	___
d. Date of last fire inspection with results filed with library records	___	___
e. Fire extinguisher inspection date current	___	___
f. Fire suppression equipment operable: look for integrity of equipment, condition of plumbing, date last inspected.		
1. smoke alarms	___	___
2. sprinkler system	___	___
3. portable extinguishers	___	___
g. Location and condition of flashlights _____/batteries strong? _____.		
h. Transistor radio working	___	___

**Additional Findings/Comments:**

\_\_\_\_\_  
\_\_\_\_\_

**Staff Disaster Response Training**

**Date:**

---

---

**Staff knowledge of:**

*trained    needs training    comments*

---

**a. Fire extinguisher location**

**b. flashlights location**

**c. security procedures**

**d. evacuation procedures**

**e. initiation of disaster response procedures**

**f. location of disaster response box**

**j. Last Fire Drill:**

**Month/year** \_\_\_\_\_

**Staff trained** \_\_\_\_\_

\_\_\_\_\_

**Staff not present** \_\_\_\_\_

**k. Last tornado drill**

**Month/year** \_\_\_\_\_

**Staff trained** \_\_\_\_\_

\_\_\_\_\_

**Staff not present** \_\_\_\_\_

**l. Date of last insurance review and update:** \_\_\_\_\_



## EMERGENCY INSTRUCTION SHEET

The following guidelines will be adhered to in the case of an emergency which threatens library patrons, the building exterior or interior, or any portion of the collection. An emergency is defined as any event which has the potential to create injury and/or damage to physical property or the collection. Fires (both internal and external), smoke damage from adjacent fires, environmental damage from storms, bomb threats, broken plumbing (to include water mains outside of the library), and vandalism are all examples of emergencies which may require portions of the library's disaster response plan to be implemented. Evacuation steps are detailed in the Emergency Evacuation Plan. Priority of notification is (1) Police, (2) Fire Department (3) library director (4) library disaster response officer.

**POLICE:** Call 911: Identify yourself and nature of emergency

**IF YOU DO NOT HAVE TIME TO CALL OR YOU BELIEVE YOU OR ANY OF THE OTHER STAFF/PATRONS MAY BE THREATENED BY A SUSPICIOUS OR PROVOCATIVE PERSON THEN IMMEDIATELY ACTIVATE THE SILENT ALARM WHICH IS DIRECTLY CONNECTED TO THE POLICE AND AUTOMATICALLY TRIGGERS A POLICE/FIRE RESPONSE.**

**FIRE:**

1. Call 911 (local police 647-2244/fire number 647-2245)
2. Ask police to notify: (if you are too busy conducting a building evacuation)
  - a. Library Director: Pat Lindley 647-3051
  - b. Disaster Response Officer: Gloria Dybo 647-5574
3. Initiate building evacuation
4. Account for staff, relocate outside of the building, and maintain observation of all entry/exit points to prevent theft and advise fire teams if needed.

**WATER:**

1. Notify supervisor/Director
2. After normal daytime work hours/weekends call Pat Lindley, Director, 647-3051
3. If library materials are threatened or have sustained damage call Pat Lindley, Director, 647-3051

**OR Disaster Response Coordinator, Gloria Dybo, 647-5574**

4. **If water threatens computer electronic systems:**
  - a. **move all personnel away from area.**
  - b. **notify fire department**
  - c. **shut off building power at junction box (only if area is dry)**
5. **If water threatens paper based materials from the floor:**
  - a. **Move books to higher shelves if possible**
  - b. **Move materials to another location**
6. **Water threatens library materials from above:**
  - a. **Cover with plastic sheeting, located in the emergency cart**
  - b. **If sheeting is unavailable:**
    - (1) **Move materials off shelves using booktrucks**
    - OR**
    - (2) **Carry materials to dry location**

## **BUILDING DAMAGE**

1. **If the building is damaged as a result of high winds, hail, vandalism, or fire from adjoining structures notify (in order):**
  - a. **Police Department**
  - b. **Fire Department (situation dependent)**
  - c. **Library Director: Pat Lindley, 647-**
  - d. **Disaster Response Officer, Gloria Dybo, 647-**
2. **Broken windows:**
  - a. **move materials away from area.**
  - b. **cover break with plastic and tape (both sides if possible)**
3. **Fire spreading to building.**
  - a. **evacuate patrons**
    - (1) **establish headcount**
    - (2) **post staff at unsecured exits**
    - (3) **ensure building is cleared of all patrons**
    - (4) **assemble staff**

**b. activate disaster response team:**

- (1) notify police/fire department of evacuation completion**
- (2) call Disaster Response Coordinator, Gloria Dybo, 647-5574**
- (3) Notify Director, Pat Lindley, 647-3051**

**4. If either the Director or Disaster Response Officer is unavailable go to the next available person on the Disaster Alert Roster.**

**EMERGENCY INSTRUCTION  
PHONE TREE**

**SENIOR STAFF ON DUTY  
IDENTIFY EMERGENCY  
CALL 911  
INITIATE EVACUATION  
(IF NECESSARY)**

**CALL LIBRARY DIRECTOR  
RESPONSE  
647-3051**

**CALL DISASTER  
OFFICER  
647-5574**

**Assesses situation  
Initiates coordination  
Contacts spt groups  
Conducts liasion**

**ACTIVATES  
DISASTER  
RESPONSE  
TEAM**

**Conducts initial survey  
Organizes recovery tms  
Conducts recovery**

**DISASTER RESPONSE  
TEAM**

**Recovery team members**  
Jodie Holben 647-2799  
Jane Snodgrass 647-3009  
Kay Knight 647-2931

**Recovery team members**  
Fran Zacharias 647-2931  
Bonnie Husman 355-4507  
Pat Hutchins 647-3685

## Essential Supplies

For a disaster response plan to remain effective it is important that certain supplies be pre-positioned within the library in case a disaster occurs. The supplies, at a minimum, should be sufficient enough to at least arrest and prevent the further damage of materials. Such items include plastic sheeting, scissors, duct tape, some spare 1 x 2 battens to hold plastic sheets in place across broken window, and paper towels. The library Disaster Response Officer must keep in mind that a disaster common to the local area, blizzard/tornado etc., will make it difficult if not impossible to procure critical supplies and services beyond the critical seventy two hours when water soaked materials begin to be rapidly affected by mold. The following list suggest essential supplies which can be procured locally and are inexpensive to purchase and require little storage space. Many items need not be purchased and common around the house. They can be brought in by staff and volunteers in the event of disaster. It is only necessary to identify who will bring which item.

### Cleanup and General Housekeeping Supplies:

Paper towels  
rubber gloves  
mops  
buckets  
brooms and dustpans (large floor brooms are best)  
plastic garbage cans (30 gallon or larger)  
shovels  
rakes  
wheel barrels  
vacuum cleaners (regular and dry/vacs)  
rubber/work boots (rain boots work fine)  
disinfectant (household is fine though industrial grade is better)

### Equipment

book trucks (additional ones can be procured from local libraries and the school district)  
fans (all sizes to include large industrial units)  
hair dryers  
dehumidifiers  
dollies  
heavy duty gauge extension cords  
wooden pallets  
portable generators

flash lights (batters powered)  
mechanic lamps with extension cords  
sump pump  
crowbars and hammers  
general purpose tools such as pliers and screwdrivers etc..  
trucks, both local volunteer pick up vehicles and larger trucks to include refrigerated vehicles  
freezer units  
pagers/beepers  
access to cellular phones  
bungee straps used for securing loads on top of cars, back packs etc..

**Supplies needed for environmental protection and salvage efforts**

plastic sheeting  
1x2 wooden battens (furring strips used in construction/remodeling)  
dust cloths  
dry chemical sponges  
dry ice (for freezing small quantities of materials)  
extra fine steel wool  
blotting paper  
plastic crates (milk crates)  
weights (even wooden ones can be used if sealed with aluminum foil)  
aluminum foil  
bookends  
plastic garbage bags  
paper pads, waterproof pens, acetate to write on  
sealing tape  
fishing line (1/32 diameter)  
waxed or freezer paper  
duct tape  
scissors/paper cutters  
buckets  
clean uncontaminated water  
colored tape for sorting items by subject/condition/etc..  
clothesline/and clothespins  
cotton working gloves  
rubber gloves  
screen racks  
erasers  
aprons, especially any that can hold tools  
absorbent paper used for interleaving materials such as unprinted newspaper and other

**ph neutral papers sold by various preservation companies**  
**book binders board cut in standard sizes**  
**plywood (half or 3/8 inch) covered with plastic sheeting which can be used to block windows and when supported with saw horses used for work tables.**  
**paper towels**  
**soft cotton cloths**  
**artist brushes, all sizes both nylon tip and hog bristle**

**FIRE/DISASTER INSPECTION CHECKLIST<sup>25</sup>**

**Building Inspection**

**1. Roof:**

*yes*      *no*

**Is the roof covering intact and not showing signs of cracking or peeling?**      \_\_\_\_\_

**Are drains unobstructed?**      \_\_\_\_\_

**Are lighting arrestors in good condition and secured?**      \_\_\_\_\_

**Is the area underneath the roof free from pests and birds?**      \_\_\_\_\_

**Is the roof fire suppression system secure and not showing signs of leaking, broken/worn supports or corrosion?**      \_\_\_\_\_

**Is the general roof area clean and free of debris?**      \_\_\_\_\_

**Is the roof access stairs unobstructed and easy to access?**      \_\_\_\_\_

**2. Floors**

**Are all doors kept unobstructed and do they close securely?**      \_\_\_\_\_

**Are fire exits and directional signs easy to read and convey accurate information?**      \_\_\_\_\_

**Is the emergency lighting system operable?**      \_\_\_\_\_

**Are all corridors and stairways unobstructed?**      \_\_\_\_\_

**Are all the fire exits unobstructed and can they easily be opened?**      \_\_\_\_\_

**Are sprinklers unobstructed by book stacks or storage item**      \_\_\_\_\_

**Has the most recent vendor fire suppression system inspection been reviewed for recommendations?**      \_\_\_\_\_



**Are all fire detection and fire suppression systems in service and tested regularly?** \_\_\_\_\_

**Are extinguishers properly hung and tagged with inspection tags?** \_\_\_\_\_

**Do all staff personnel understand how to use fire extinguishers?** \_\_\_\_\_

**Is a Halon type fire extinguisher available for suppressing electrical driven fires?** \_\_\_\_\_

**Is the housekeeping service monitored to ensure dust and other combustionable materials are removed from the building?** \_\_\_\_\_

**Are cleaning supplies safely stored?** \_\_\_\_\_

**Are all trash receptacles emptied at least daily?** \_\_\_\_\_

**Are any fuels or flammable solvents properly stored within the library building?** \_\_\_\_\_

**Are supply closets and work areas clean and orderly?** \_\_\_\_\_

**Ground Floor**

**Do entrance and exit doors provide unobstructed passage?** \_\_\_\_\_

**If a security system is installed will it hinder rapid exit?** \_\_\_\_\_

**Basement**

**Is refuse/combustionable materials stored in the basement?** \_\_\_\_\_

**Are flammable materials routinely purged from any basement storage sites?** \_\_\_\_\_

**Are sprinklers unobstructed and at least 18 inches above any stored items?** \_\_\_\_\_

**Is mold present?** \_\_\_\_\_

**Are there water leaks in any of the basement plumbing?** \_\_\_\_\_

**GENERAL LIBRARY/PATRON AND STAFF AREAS**

**Reading Rooms, study carrels and exhibit areas (basement display)**

**Is a high standard of housekeeping maintained by employees and patrons?** **YES** **NO**  
\_\_\_\_\_

**Are smoking regulations enforced on staff and users?** \_\_\_\_\_

**Are aisles to exit routes unobstructed and visible?** \_\_\_\_\_

**Is exit signage clear and informative?** \_\_\_\_\_

**Is an emergency response kit established?** \_\_\_\_\_

**Does staff know how to activate the disaster response team?** \_\_\_\_\_

**Does staff know how to initially protect catalog materials using the supplies available to the library?** \_\_\_\_\_

**Are exhibit housings, fittings and other accessories non-combustionable or fire retardant treated?** \_\_\_\_\_

**Do any exhibits or informational displays block or interfere with fire/security suppression systems?** \_\_\_\_\_

**COLLECTION STORAGE AREAS**

**Are fire extinguishers in these areas clearly marked, visible, and easy to get at?** \_\_\_\_\_

**Has the automatic fire alarm system been tested from a collection area within the last six months?** \_\_\_\_\_  
**(date)** \_\_\_\_\_

**Has the alarm system link to the fire department been tested and validated within the last six months?** \_\_\_\_\_  
**(date)** \_\_\_\_\_

**Do the walls and interior collection storage areas present an adequate temporary fire barrier?** \_\_\_\_\_

Have the security lights been tested within the last six months? (date) \_\_\_\_\_

\_\_\_\_\_

**STAFF SERVICE DESK AND WORK AREA**

**YES NO**

Is the staff work area clean and unobstructed?

\_\_\_\_\_

Are flammable solvents and other chemicals properly labeled and stored in small quantities in ventilated (if required) storage cabinets?

\_\_\_\_\_

Are self closing safety waste disposal receptacles available at work stations, especially where book/periodical repairs are made?

\_\_\_\_\_

Are appliances unplugged when not in use?

\_\_\_\_\_

Are exit routes from the staff area unobstructed?

\_\_\_\_\_

Do all staff members know how to activate the security alarm system?

\_\_\_\_\_

Are all staff employees trained in basic fire/awareness?

\_\_\_\_\_

Are all staff members knowledgeable in how to activate the disaster response program?

\_\_\_\_\_

Is entry to the staff service area and other restricted library areas limited to authorized persons?

\_\_\_\_\_

**BASEMENT MEETING ROOM**

Is safe capacity posted?

\_\_\_\_\_

Is occupancy restricted to the capacity posted as safe?

\_\_\_\_\_

Are exits unobstructed and secured?

\_\_\_\_\_

Are the basement and furnace room door exits illuminated?

\_\_\_\_\_

Are smoking regulations enforced?

\_\_\_\_\_

**STAFF BREAK ROOM**

Are appliances left unplugged when not in use?

\_\_\_\_\_

YES NO

Is trash removed daily?

\_\_\_ \_\_\_

Is the sprinkler system functional?

\_\_\_ \_\_\_

If smoking is permitted are self-closing butt cans available?

\_\_\_ \_\_\_

Are there any leaks in the sink/bathroom plumbing?

\_\_\_ \_\_\_

**BUILDING EXTERIOR**

Do all emergency exits and fire escapes have unobstructed out of the building?

\_\_\_ \_\_\_

Is the area along the sides of the library building free of flammable materials and trash?

\_\_\_ \_\_\_

Do any surrounding buildings present a fire hazard? (abandoned, trash piles, uncut brush, visible drums of suspected fluids, hazardous waste etc..)

\_\_\_ \_\_\_

Are fire hydrants which would be used to suppress a library fire free from obstruction?

\_\_\_ \_\_\_

**LIBRARY STAFF**

Do all staff members know how to initiate the fire alarm security alarm?

\_\_\_ \_\_\_

Do all staff members understand how to implement the disaster response team?

\_\_\_ \_\_\_

Does the library staff know their duties and responsibilities in the event of a disaster?

\_\_\_ \_\_\_

Are staff personnel proficient in how to use a portable fire extinguisher and which kind of extinguisher depending on the fire source?

\_\_\_ \_\_\_

Does the library staff know their responsibilities in fire prevention disaster response?

\_\_\_ \_\_\_

Is the emergency response checklist reviewed by each senior staff member at the beginning of each shift? \_\_\_\_\_

Is the disaster response plan up to date and reviewed by the Library Director and Disaster Response Officer semi-annually? \_\_\_\_\_

Has the disaster response plan be distributed to each member of the disaster response team, fire and police authorities, and, at a minimum, does the Library Director and Disaster Response Officer maintain a current copy at home? \_\_\_\_\_

Date of the latest disaster response drill? \_\_\_\_\_

**INSPECTION COMMENTS**

Inspection by: \_\_\_\_\_ Date \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_

**Recommended Corrective Action:**

Item	Referred To
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Corrective Actions completed: \_\_\_\_\_ Date \_\_\_\_\_

## EMERGENCY FIRE EVACUATION PLAN

**GENERAL INFORMATION: THE SENIOR STAFF MEMBER RESPONSIBLE FOR THE BUILDING'S EVACUATION AND EMERGENCY NOTIFICATION WILL KEEP A COPY OF THE EMERGENCY FIRE EVACUATION PLAN ON THEIR PERSON AT ALL TIMES. The procedures used for fire evacuation will also be implemented in case of any other emergency action to include bomb threats, gas leaks, or personnel security. In such cases the senior person or if time does not permit, any staff member/patron will call 911 and declare an emergency.**

**1. If the fire alarm is tripped by sprinklers or smoke detectors, the alarm will sound. If the switches are pulled the alarm will also be tripped. unless you see someone pull the alarm, do not assume it is a false alarm. Fire zones are posted on the red fire panel; the zone where the alarm originated will light up on the panel. Zone 8 (TROUBLE) means a power interruption or other internal problem; it will set off the alarm but will NOT generate an alarm call to the fire department/emergency services.**

**2. There are fire extinguishers on every floor. A wastepaper basket fire or small blaze can be controlled with a hand held extinguisher if it is acted upon quickly. ALWAYS ensure the alarm has been activated prior to attempting to put out the fire in case the blaze rapidly gets out of hand or you are trapped or injured attempting to put out the fire.**

**MAIN FLOOR - above the compact disk display case**

**SECOND FLOOR - west wall**

**BASEMENT**

- meeting room
- staff room
- furnace/storage room

**3. As you go through the building alerting patrons, make sure all interior doors are closed, especially the stairways but also all room doors.**

**4. Do not assume people are leaving on their own. Follow the directions established in the emergency instructions for ensuring all building personnel are accounted for. Follow the last person out of your assigned zone and close any doors behind you. Do not let anyone back into the building, staff or patron, once the building has been evacuated. Reentry will be authorized only after the responsible public official (fire marshall/police department) have delegated permission to the Library Director.**

## **FIRE ALARM PROCEDURE**

In case of fire the senior staff member will assume responsibility as outlined in the emergency procedures instruction sheet.

1. Assemble all staff and assign one or more zones to each for clearing.
2. Check the red fire panel to find the alarms's origin. The alarm system should have already called in the alarm and its location. You may receive a call to confirm that a fire has been possibly detected. Verify the zone of the alarm. If you have any reason believe the alarm was not dialed immediately call 911.
3. Check you assigned zone/zones and once your area is clear notify the person in charge and relocate to the northeast corner of the parking lot with other staff. An alternate collection point is directly north and across the street from the library. Once staff has been accounted for ensure that building security is maintained. Do not allow anyone back into the building. Coordinate with local police/fire service to ensure this is done. Security of the collection is critical during such periods since looting and theft often occur with any disaster. **DO NOT LOCK** doors or turn off lights if it means returning to the building. **DOORS** should be left unlocked to facilitate entry by emergency personnel.
4. Wait for fire department personnel and direct them to the entrance nearest the alarm zone. Provide a floor plan (attached at enclosure) to speed movement through the buildings interior.
5. Notify the Library Director and Disaster Response Coordinator if either is not present.
6. Assume responsibility for the library as a point of contact between the responding authorities and the library director/disaster response coordinator until one or both of them arrive.

**BUILDING ZONES:** For emergency evacuation purposes the building is subdivided into four zones. Each staff member on duty will take one or more of the following zones and ensure the zone is cleared of library users and that doors are closed, electronic equipment turned off and each area of concern is cleared.

### **ZONE 1**

1. Walk through the Compact Disk aisle to the Young Adult corner and check each aisle through the non-fiction section. Exit the non-fiction section at the copier machine and unplug it. Cross the front door threshold and clear the reference room turning off the computers.

2. Check the circulation desk area, new books, and videos.
3. Ask all persons in these areas to leave immediately by the front door. Follow the last person out and make sure the door is closed but not locked.
4. Meet other staff at the northeast corner of the parking lot or if that area is congested with emergency vehicles or bystanders relocate to the alternate site directly across the north side of the street opposite the library.

#### **ZONE 2: CHILDREN' ROOM AND MAIN FLOOR REST ROOM**

1. Taking the restroom key, walk through the juvenile section ensuring all tables and carrels are cleared of personnel who will be directed to leave by the front door.
2. Open the restroom and check it. Turn off the lights.
3. If fire prevents leaving by way of the front door, patrons will be instructed on how to leave the building by way of the stairway doors, down to the lower level and out the north side street level door.
4. **DO NOT PERMIT ANYONE (INCLUDING HANDICAPPED) INTO THE ELEVATOR**
5. Turn off furnace breaker #42 at the electrical panel located in the furnace room. Leave the lights on for emergency personnel. While you are doing this ensure a responsible person maintains security at the exit door and does not permit anyone to reenter the building.
6. Follow the last person out and make sure the door is closed but not locked.
7. Relocate to the staff primary or secondary collection point.

#### **ZONE 3: SECOND FLOOR, NORTH AND SOUTH MEZZANIES**

1. Go up the south mezzanine stairs. Walk across the second floor checking all aisles. cross the north mezzanine and return by the north stairs.
2. Ask all persons to leave immediately by the front door. Follow the last person out and close the door.
3. If fire or debris etc. prevent exit from the front door move personnel down to the lower level and exit them out the side entrance. **DO NOT LET ANYONE GET ON THE ELEVATOR.** Follow the last person out and make sure the stairway and outer doors are closed.



4. Meet other staff at the primary or secondary collection point.

#### **ZONE 4: GROUND FLOOR/STAFF SERVICE DESK**

1. Take the master key and elevator key and move to the basement by way of the stairs.

2. Bring the elevator to the lower level and turn it off.

3. Check the two restrooms and the staff room. Ensure all doors are closed. Check the storage room and secure door.

4. Go to the furnace room and turn off breakers #19, 27, and 29 in the electrical room and close all doors behind you.

5. Leave through the meeting room and check the conference room as you pass. If a meeting is in progress ask everyone to leave by the meeting room door. Follow the last person out of the meeting room making sure the door is closed.

6. If either the meeting room area or side entrance is threatened evacuate personnel through the furnace room service door.

7. Relocate with the other staff at either the primary or secondary collection points.

#### **NOTES**

1. If short staffed one person can take zones 1 and 3 and the other zones 2 and 4.
2. Be prepared to assume responsibility for unaccompanied children.
3. Be prepared to assist emergency response personnel.
4. If the disaster which has affected the library is part of a larger event within Wellington, try to have one staff member remain to ensure collection security if other staff must return home.

## HERRICK MEMORIAL LIBRARY KEY CONTROL LOG

### Key control log

- a. Custodian: \_\_\_\_\_ Phone Number: \_\_\_\_\_
- b. Duties and responsibilities of the key control custodian:

The key control custodian ensures all keys are accounted for and that a record is made of each key, any duplicates, and who currently possess a key to the building or any of its parts. The custodian is the sole controller of all keys and this responsibility can only be transferred to an alternate when a 100% key inventory has been accomplished.

### KEY CONTROL NUMBERS (INSERT SERIAL NUMBER OR OTHER IDENTIFYING NUMBER ON KEY)

1.	x	for:	
2.	x	for:	
3.	x	for:	
4.	x	for:	
5.	x	for:	
6.	x	for:	
7.	x	for:	

KEY ISSUE AND TURN IN					
KEY NUMBER RECEIVED BY	DATE ISSUED	ISSUED BY	ISSUED TO	TURNED IN BY	

## Conclusion

The development of a viable disaster plan was shaped by both internal and external considerations. The library budget does not support the implementation of a commercially prepared plan and consultant service. Pre-paid financial commitments to recovery vendors was ruled out as an option when vendor selection was considered. And lastly, no disaster program would be acceptable if it involved any modification to the library's historical appearance. Internal considerations included the lack of sufficient staff time and training needed to develop an in-depth disaster plan addressing every possible issue. A program would have to be low cost, simple, and easy to rapidly implement and execute. Vendors would have to be able to respond rapidly and understand the unique nature of salvage operations at a small institution where many damaged items would probably not be retained for recovery.

Selection of vendors with experience in small library disasters became a key criteria. Many large vendors are reluctant to commit themselves to a small library recovery operation which ties up resources but may not produce a substantial return. Therefore the search for reputable recovery specialists with good reputations had to be painstakingly carried out before a recommendation could be made to the library director. Two companies were recommended. The first was BMS Catastrophe, Ft. Worth Texas. They have response teams in Springfield, Virginia and Chicago, Illinois and can respond within one day. BMS has a non-binding contract which allows the library director to choose another vendor without penalty. Additionally BMS is highly competitive and will adjust its prices to meet or exceed those of another vendor. BMS enjoys a good reputation and recently completed a restoration project at the Strongsville High School which experienced a major fire disaster accompanied by water damage. The second vendor, Steamatics, has an office in Cleveland and they specialize in smaller recovery operations in the forty to sixty thousand dollar range. They compliment BMS which generally responds to more damaging and expensive recovery projects. Both offer the full range of recovery services to include freeze drying, smoke damage, and internal restoration. In addition, they provide full consultation services, site surveys, and commercially prepared disaster plans at a reasonable cost.

Other important considerations in developing a disaster plan for a small library concerned staff training and location of assets and supplies. Staff awareness and training are critical to any successful plan. Much of the burden for this was placed upon the person identified as the disaster recovery officer. She had the most experience in preservation and conservation issues and was available for additional preservation training. Local preservation workshops were identified and the library set aside funds for preservation training. The goal of sending the disaster recovery officer to preservation workshops was to not only increase her knowledge of conservation practices but also lay the foundation for the development of a systematic preservation policy which the disaster plan would be integrated into. The fire marshall will support staff training for fire danger recognition and suppression as well as advise on other emergency issues such as wind/hail/tornado damage and evacuation drills.

The location of supplies, storage sites for freezing materials, and an alternate library site pose a different set of problems. Since costs had to be minimized to the greatest extent possible, the library director decided that only essential supplies would be purchased. These items would be available to meet the demands of a very small recovery effort. In the case of a larger event, insurance would cover the costs of increased quantities of supplies as well as personnel. Many of the large items such as industrial fans, sump pumps, dehumidifiers are locally available for both rental and purchase. The difficulty in identifying storage sites for freezing materials is due to Wellington's small size. There is no facility which could store more than a small part of the library's total collection and the increased distance and costs of going out of town would only add to the logistical problems confronting the library recovery team. The identification of an alternate library site is ongoing. The library director had to develop first criteria for a new location in terms of accessibility by patrons, electrical capacity, and delivery of as many services as possible. Site selection has proven difficult since there are many variables involved which the library director has little control over. Such issues as the availability of commercial property at the time of a disaster cannot be determined until a disaster occurs. In addition, any temporary site must be able to support some level of automation to include temporary special telecommunication links to the Ohio Public Library Network (OPLIN). At this time OPLIN does not have a plan which specifically addresses if and to what extent they will support a temporary library facility.

National Archives and Records Administration  
Salvage of Water Damaged Library Materials  
The Library of Congress  
'Procedures for Salvage of Water Damaged Library Materials'  
by Peter Waters, July 1993

## INTRODUCTION

Since the first publication in 1975 of 'Procedures for Salvage of Water-Damaged Materials' there has been no decrease in the frequency of accidents or unexpected disasters which have resulted in extensive water damage to library materials but there are many signs that we have begun to learn the immense value of disaster preparedness planning. Being familiar with the necessity of having to make a series of interrelated decisions promptly, understanding the effects of any particular course of action on subsequent ones—this is the best kind of preparation needed in the event of major water-damage problems. A well-organized plan can greatly reduce the costs of salvage and restoration as well as the proportion of outright losses. This preparedness can also go a long way to lessen the emotional and stressful impact upon human beings.

The various courses of action discussed in this revised edition are designed to save the maximum amount of material with minimum amounts of restoration on the one hand or replacement on the other. However, it cannot be emphasized too much that no general instructions can take the place of an assessment of a given situation on site by a qualified, experienced library or archive specialist, who has proven experience in the reclamation of fire and water-damaged collections. It is strongly recommended that such assistance and advice be sought at the earliest moment after a disastrous event has occurred. In addition, the Conservation and Preservation Research and Testing Offices of the Library of Congress stand ready to serve as a technical information center and, if need be, a coordinating agency for emergency salvage efforts.

Library and archive staffs are now generally better informed about the mechanisms of drying cellulosic materials as well some of the technologies developed for this purpose. The use of vacuum chambers for drying large quantities of books and paper records has become an acceptable, almost common approach, but not without some confusion as to the differences and relative merits of vacuum drying and vacuum freeze-drying. Both methods effectively remove water but by quite different mechanisms and often with quite different results. An understanding of how these technologies function is essential in planning for a recovery operation, in order to make the best possible match between the nature, condition and needs of the materials and the capabilities of a particular drying system.

The use of fungicides to control the spread of mold growth has become an increasingly controversial subject because they may cause severe danger to workers and in some cases to the materials treated. Sterilizing by means of ethylene oxide and related chemicals has come under close scrutiny by the EPA, to the extent that we cannot recommend its use except by a commercial business firm which is fully insured and licensed to perform this service. Treatments involving the use of ethylene oxide (ETO), are best carried out under controlled conditions, as in vacuum chambers at the end of a drying cycle, and they must be guaranteed to leave no residual toxicity in the material. ETO remains the most effective treatment for severe mold attack resulting from major disasters, especially those exposed to river water. The critical decisions that have to be made following water damage require knowledge of available drying technologies and their effects on a variety of composite materials. Ideally, materials removed from site, should be prepared and packed in a manner most suitable for the drying method to be used. Unfortunately, what tends to happen, particularly when no emergency plan exists, is that wet material is packed and shipped off to freezing facilities without knowledge of how the material will be dried. This may result in the material having to be re-packed before drying which adds considerably to the cost of drying and the potential for further damage.

The complete restoration of water-soaked documents, particularly bound items, can be a costly process even under the most favorable conditions. In the majority of cases, the high costs involved do not justify the salvage and restoration of books which are in print and can be replaced. However, decisions relating to these factors are virtually impossible to make during a salvage operation and even when a disaster plan exists. On the other hand it might be unwise not to attempt to salvage everything, if an insurance assessment is required and a claim is to be made.

Freezing, followed by vacuum freeze drying has been shown to be one of the most effective methods for removing water from large numbers of books and other paper records, but drying is not the final step in the reclamation process. In some cases, volumes which are only damp or which have suffered minor physical damage before freezing may come from a drying chamber in such good condition that they can be returned to the shelves. It is preferable that, where possible, the packing on site should be carried out in such a manner as to segregate very wet material from that which is partially wet and those that are damp from exposure to high humidity conditions. This will not only result in cost savings during the drying operation but will help to avoid over drying of the least wet material. In the majority of instances, drying must be followed by restoration and rebinding, and therefore the technique and success of the drying method chosen will directly affect the final cost of restoration. This can be very expensive. Thus, librarians and others faced with decisions which follow serious flooding and water damage from the aftermath of fire, and related water-damaged exposure, need to be reminded that replacement is nearly always much less costly than salvage and restoration. The necessity for making sound, on-the-spot, cost-effective judgments is the best reason for being prepared in advance by developing a pre-disaster preparedness plan. There are a number of such plans that have been drawn up, which can be found in the literature, to serve as models.

## COATED PAPERS

Coated papers are the most vulnerable to complete loss and should not be permitted to begin drying until each volume can be dealt with under carefully controlled conditions. The period between removal and freezing is critical. It may be necessary to re-wet them with clean cold water until they can be frozen. During the aftermath of the Corning Museum Library river flood of 1972, it was found that the highest percentage of water damaged books were printed on coated stock papers and that when they were frozen in the wet state most were dried successfully by freeze-drying.

## ARCHIVAL BOX FILES

Archival box files often fare better than book material because their boxes are made of porous board stock which can be expected to absorb most of the water, protecting the contents inside. This would not be the case of course if they were completely immersed under water for many hours. During recovery, the contents of each box should be carefully inspected and the box replaced if it is water saturated. Failure to do so will increase the risk of physical damage as boxes collapse from pressure during recovery, shipment and cold storage.

## ACCESS

Where water damage has resulted from fire-fighting measures, cooperation with the fire marshal, and health and safety officials is vital for a realistic appraisal of the feasibility of a safe salvage effort. Fire officers and safety personnel will decide when a damaged building is safe to enter. In some cases, areas involved in a fire may require a week or longer before they are cool and safe enough to enter. Other areas may be under investigation when arson is suspected. There may be parts of a collection that can be identified early in the salvage planning effort as being especially vulnerable to destruction unless they receive attention within a few hours after the fire has abated. If the fire marshal appreciates such needs, he may be able to provide means of special access to these areas even when other parts of the building remain hazardous.

Perhaps the most important and difficult decision to make after an assessment of damage has been made, is whether to remove the wettest materials first or to concentrate on those that are only partially wet or damp. If the majority are in the latter category the best course may be to recover these first since they may develop mold if they are left in dank and humid conditions while the wettest material is removed. A balance must be struck between the reduction of moisture content in the affected areas and the time involved for the safe removal of the majority of the collections in the best condition. To remove the wettest material first will obviously lower the moisture content, but it is often the case that this can be difficult and time consuming owing to the fact that shelves become jammed with swollen wet books and boxes that may require special equipment to free them. The aim is always to recover the majority of the collection in the best condition to avoid additional harm and costs brought about by post-disaster environmental damage.

Once all entrances and aisles have been cleared, in addition to the above considerations, the most important collections, including rare materials and those of permanent research value, should be given priority unless other material would be more severely damaged by prolonged exposure to water. Examples of the latter are books printed on paper of types widely produced between 1880 and 1946, now brittle or semi-brittle. However, materials in this category which can be replaced should be left until last.

## STABILIZING THE ENVIRONMENT

Salvage operations must be planned so that the environment of water damaged areas can be stabilized and controlled both before and during the removal of the materials. In warm, humid weather, mold growth may be expected to appear in a water-damaged area within 48 hours. In any weather, mold can be expected to appear within 48 hours in poorly ventilated areas made warm and humid by recent fire in adjacent parts of the building. For this reason, every effort should be made to reduce high humidities and temperatures

and vent the areas as soon as the water has receded or been pumped out. Water-soaked materials must be kept as cool as possible by every means available and be provided with good air circulation until they can be stabilized. To leave such materials more than 48 hours in temperatures above 70 degrees Fahrenheit and a relative humidity above 60 percent without good air circulation will almost certainly result in heavy mold growth and lead to high recovery and restoration costs. Damaged most by these conditions are volumes printed on coated stock and such highly proteinaceous materials as leather and vellum bindings. Starch-impregnated cloths, glues, adhesives, and starch pastes are affected to a somewhat lesser degree. As long as books are tightly shelved, mold may develop only on the outer edges of the bindings. Thus no attempt should be made, in these conditions, to separate books and fan them open.

As a general rule, damp books located in warm and humid areas without ventilation will be subject to rapid mold growth. As they begin to dry, both the bindings and the edges of books will be quickly attacked by mold. Archival files which have not been disturbed will not be attacked so quickly by mold. A different problem exists for damp books printed on coated stock, since if they are allowed to begin to dry out in this condition, the leaves will quickly become permanently fused together.

## **ASSESSMENT OF DAMAGE AND PLANNING FOR SALVAGE**

Weather is often the critical factor in determining what course of action to take after any flood or fire in which archive and library materials are damaged. When it is hot and humid, salvage must be initiated with a minimum of delay to prevent or control the growth of mold. When the weather is cold, more time may be taken to plan salvage operations and experiment with various reclamation procedures.

The first step is to establish the nature and degree of damage. Once an assessment of the damage has been made, firm plans and priorities for salvage can be drawn up. These plans should include a determination of the special facilities, equipment and personnel required. Overcautious, unrealistic, or inadequate appraisals of damage can result in the loss of valuable materials as well as confusion during all phases of the recovery operation. Speed is of the utmost importance, but not at the expense of careful planning which must be aimed at carrying out the most appropriate, safe and efficient salvage procedure within the circumstances prevailing. An efficient record keeping system is a must. Inventory of call numbers, shelf location and packing box numbers will help make the task of receiving collections returned after drying so that their original shelf locations can be identified, as efficient as possible.

Maintaining a detailed photographic and written record of all stages in the recovery operation is an essential, but often overlooked task which will aid the process of insurance claims and demonstrate the condition of the material before it is frozen and dried. We have found that on receiving materials back from a drying process, some administrators are shocked by the appearance of distorted material, believing perhaps that the condition should be much better, or be somewhat restored! The photographic record can be a very helpful reminder that distortion is mostly the result of the initial water damage and not necessarily the result of the drying process. The photographic record should provide key evidence for the reasons and nature of additional damage resulting from any part of the recovery process.

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## THE RECOVERY TEAM

Conducting a successful and efficient recovery operation after a major flood or similar disaster requires addition to a good supply of dedicated labor, a team of experts who should be assembled before practical work begins. The leader should be a person who has had practical experience and understands the effects of different environmental conditions on water-soaked materials of all types, conditions, and ages.

### ***The team leader should to be assisted by custodians who know the***

collection intimately, conservators who can provide additional advice and guidance as well as help in training workers in safe removal procedures; procurement specialists; building maintenance engineers; electricians; carpenters; plumbers; a chemist if available, and health and safety experts. One or more persons familiar with national and local resources are highly desirable to assist in locating and procuring the special facilities, equipment and supplies needed during the operation. They should be familiar with using the Yellow Pages to track down materials and equipment, able to seek out the key chemical supply companies in the country, if necessary, and generally have the authority to cut through administrative red tape.

The assembled team should be carefully briefed on the recovery plan and procedures to be followed as well as various contingency alternatives which might have to be adopted, priorities to be observed, and their own specific responsibilities. Team leaders need to be identified and instructed in the details of the recovery plan and its main aims and goals. They in turn should brief all workers so that they too will understand the purpose of the plan and what is expected of each of them. A well briefed and dedicated team works much better than enthusiastic individuals who are allowed to carry out actions which may be disruptive to the main purpose of the team plan. The major objectives of this team should be:

To stabilize the condition of the materials before removal by creating the environment necessary to prevent further damage.

To recover the maximum number of material from the damaged collections in a manner which will minimize future restoration and its costs.

## PRIMARY CONSIDERATIONS FOR RECOVERY OF WATER-DAMAGED COLLECTIONS

Seek the advice of specialists who can assist at the site of the disaster.

Organize a disaster team and prepare a comprehensive plan of action, as well as plans for different contingencies.

Do not attempt to remove materials from the area until an overall plan with a schedule of priorities has been established and all personnel thoroughly briefed and trained.

In winter, turn off all heat in the building. In summer, reduce temperatures as much as possible through air-conditioning.

Create maximum air flow through all affected areas by opening doors and windows. If electrical facilities are

operational, use as many fans as can be acquired to create a current of air so directed as to expel humid air from the building. Use dehumidifiers together with air conditioning and a good air flow. The objective is to

avoid pockets of stagnant air and to reduce moisture content.

If house electricity is not available, hire portable generators to provide electricity for lights, fan, dehumidifiers,

and other electrical services. For safety purposes, all electrical lines should be waterproofed and grounded

and be administered by health and safety personnel. Do not permit anyone to open wet books; to separate single sheets; to remove covers when materials are water-soaked; or to disturb wet file boxes, prints, drawings, and photographs. Such handling can result in extensive and often irreparable damage to materials that otherwise might be salvaged. Reducing the cost of future restoration must be one of the top priorities of the salvage operation.

Canvass the community to locate freezing and storage space.

Locate sources of one cubic foot milk crates and corrugated board boxes.

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## **PRELIMINARY STEPS IN THE EVACUATION FROM WATER-DAMAGED AREAS**

If the materials are to be frozen, prior arrangements should have been made to ship the packed materials immediately to freezing facilities. Packed materials must not be allowed to remain on or near the site for more than a few hours, since such delay will further increase the possibility of mold development. Before actual removal of the water-soaked material begins, lighting, fans, dehumidifiers, and all possible venting should be fully operational. All work surfaces should be covered with polyethylene sheeting. Areas selected for packing or drying should be prepared for the operation by emptying them of all unnecessary equipment and furniture.

## **REMOVAL AND PACKING OF WATER-DAMAGED MATERIALS—THE WORK FORCE**

Safety of the materials and future restoration costs will depend largely on the competence and dedication of the salvage crews. The work will be arduous, dirty, and often frustrating. Team leaders should not hesitate to dismiss careless and thoughtless workers. Experience has shown that well-disciplined crews having brief rest periods with refreshments about every hour and a half are the most efficient. Working salvage crews to exhaustion pays no dividends.

## **REMOVAL FROM WATER-DAMAGED AREA—THE CATALOG AND OTHER RECORDS**

### ***OF THE COLLECTION***

High priority should be given to salvaging the catalog and other records of the collection. Salvage operations should avoid any action that might remove or deface identifying marks and labels.

During the pre-recovery planning stage a decision needs to be made on whether or not to use a location number identification system which could be used after the material is returned from the drying operation to reassemble the collection in similar shelf order. There will be a need to identify and segregate materials which are very wet from partially wet; mold contaminated from uncontaminated; rare and sensitive items from the less rare and sensitive etc. If an orderly, efficient and safe recovery is to be achieved, together with a control over the choice of drying and other special measures needed to save rare and sensitive materials, a box coding system is indispensable.

At least one person should be assigned specific responsibility for making an inventory at each location where the materials are taken from the shelves and boxed. This person might also be given charge of supervising the boxing and box coding process.

Conveyor belts and human chains are normally used to remove large numbers of material from each shelf, pack them in corrugated boxes or plastic milk crates and to move them to the loading site for shipment to cold storage facilities. It is at this time that a great deal of additional damage and confusion can occur. The number of people involved in this operation and their behavior needs to be closely supervised. Try to initiate a rhythm when using human chains that keeps everyone busy without being overtaxed. Too many helpers will hamper progress, encourage bloating and generally reduce the efficiency of the operation. It is highly desirable to instruct the team daily on the tasks to be carried out and to keep them informed as to the major objectives of the recovery operation and as to any changes that have been made to the master plan.

An efficient and dedicated work force needs to be provided with all the accouterments of human survival, such as regular rest periods, a place to eat, a convenience to wash and clean up and a immediate access to medical attention.

Manuscripts and other materials in single sheets create particularly difficult problems if they have been scattered. An indication of the approximate location in which they are found during the salvage operation may be extremely helpful at a later date. Materials should never be moved from the site in large batches or left piled on top of each other, either at the site or in adjacent temporary housing, since the excessive weight of water-affected books and paper records can lead to severe physical damage.

When flood-damaged books were removed from the Biblioteca Nazionale in Florence following the river flood disaster of 1966 substantial numbers were piled high outside the library building while awaiting shipment to drying facilities. This action caused significant damage to the books from the weight of water saturated volumes and lead to very high costs of post disaster restoration.

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## Salvage of Water Damaged Library Materials

### HOW WATER EFFECTS BOOKS AND UNBOUND MATERIALS

Paper absorbs water at different rates depending on the age, condition, and composition of the material. Thus, some understanding of the mechanism of swelling action, as well as the development of mold, is essential to planning a successful salvage operation. In addition, when large collections are at stake, it is useful to be able to calculate in advance the approximate amount of water which will have to be extracted in a drying process. This will provide helpful data when selecting an appropriate drying method. Of equal importance is some knowledge of the length of time each type of material can be submerged in water before serious deterioration occurs.

### ESTIMATING WATER ABSORPTION

Generally speaking, manuscripts and books dated earlier than 1840 will absorb water to an average of 80 percent of their original weight. Some may absorb as much as 200% of their original weight. Since there is a greater concentration of proteinaceous material and receptivity to water in such early books and papers, they are especially vulnerable to mold when damp. Modern books, other than those with the most brittle paper, will absorb an average of up to 60 percent of their original weight. Thus, in estimating the original weight of a collection, if one assumes an average of four pounds per book when dry for 20,000 books in each category, drying techniques must be capable of removing approximately 64,000 pounds of water from the earlier materials and 48,000 pounds from the latter.

The major part of all damage to bound volumes caused by swelling from the effects of water will take place within the first four hours or so after they have been immersed. Since the paper in the text block and the cardboard cores of book bindings have a greater capacity for swelling than the covering materials used for the bindings, the text-block of a soaked book usually expands so much that the spine assumes a concave shape and the fore-edge a convex shape, thus forcing the text block to become partially or completely detached from its binding. The board cores of bindings absorb a great amount of water in such circumstances and are usually the source of mold development between the board papers and fly leaves. This is especially apparent when the area in which water damage has occurred begins to dry out and the relative humidity falls below 70%. Although it is obviously important to remove as much moisture as possible from the environment, it is essential that the water content of the material be monitored because this will remain dangerously high, long after the area is apparently safe. Action taken to salvage the material should therefore be governed by the water content of the material and not by the relative humidity of the area. A water moisture meter, such as an Aqua Boy can be used to measure the water content inside books and box files. If such an instrument is unavailable a crude but quite effective way is to use a mirror within but not touching the text block. Condensation will cloud the mirror. A water content measuring less than 7% is considered dry.

Leather and vellum books, especially those of the 15<sup>th</sup>, 16<sup>th</sup>, and 17<sup>th</sup> centuries, can usually be restored successfully if they are dried under very carefully controlled procedures. Such materials are usually classified as rare and should be treated accordingly by not mixing them with less rare materials during preparations for salvage, stabilization and drying. The advice of a certified book conservator may be essential in order to safely carry out the most appropriate methods. If the material is frozen, freezer paper should be used between each volume to prevent sticking. (Refer to the section on freeze-drying for the special requirements needed for drying this type of material).

Unfortunately, modern manufacturing processes so degrade the natural structure of leather that, once water soaked, book covers are often impossible to restore. Some leather bindings will be reduced to a brown sludge, while others will severely shrink. Swelling of covering materials, such as cloth, buckram, and certain plastics is negligible, in some cases shrinkage occurs. Book covers, however, which are made of a highly absorbent cardboard, will absorb water to a greater degree than an equivalent thickness of text block. Some book covering materials which have already deteriorated will absorb water at about the same rate as the text block.

## part 6 "REMOVAL AND PACKING"

The aisles between stacks and main passageways will probably be strewn with sodden materials. These must be removed first, separately, by human chain, in the exact condition in which they are found. Open books will be greatly swollen, but no attempt should be made to close them. Closing them will cause further damage by tearing the leaves, since paper will not slide when wet. Instead, books should be passed undisturbed to an adjacent dry area where an awaiting team may pack them without disturbing their shape. This particular type of material must not be packed tightly but should be packed flat in boxes and separated with at least one layer of freezer paper and one sheet of  $\frac{1}{2}$ " polystyrene between each open book.

The packing team should have approximately the same number of people as the team which passes the damaged material to them. This will avoid bottlenecks and stacking materials on the floor awaiting packing. If a sufficient number of people and conveyor belts are available, the most efficient place to pack damaged materials will be on site. Teams will have to be organized to assemble packing materials and supply them to the packers in a smooth flow. Use of a second human chain or conveyor will reduce bottlenecks and the likelihood of incoming supplies interfering with the flow of packed materials being passed out of the building. After the aisles have been completely cleared, the main work of recovery can begin. Hopefully, a decision will have been made as to which material to remove first: the wettest or the ones in the best condition. As stated earlier, if the majority is only damp and in relatively sound condition, these could be removed first and more rapidly than other materials. In these circumstances de-shelving and packing will be a relative quick operation and will help to establish a smooth worker flow.

As each line of shelves is emptied, an assistant should code each box and record the box number and its general contents in a notebook. The contents of archival storage boxes are unlikely to be saturated with water if they were previously positioned close together. However, since certain types of boxes have a corrugated inside layer, they may be very wet, even though the major portion of the contents is only damp. In such cases, it is best to repack the contents in new boxes or in plastic milk crates. This will not only make each unit lighter to lift and prevent the collapse of a wet box but will also speed the drying process. When repacking it is important that the new boxes be properly identified.

## DISPOSITION OF REMAINING MATERIALS AND CLEANING OF WATER-EXPOSED

### AREAS

If the wettest materials were removed first the drier material will usually be above the first four or five shelves and packed closely together. On no account should this third category be separated or spaced out during the earlier salvage efforts. Closely packed materials will not readily develop mold internally.

However, since these will have been in a very humid atmosphere for, maybe several days, it is likely that some mold will have developed on the outer edges of bindings and boxes. This is less like to occur if, during the evacuation of the wettest materials every effort had been made to reduce temperatures and humidity levels and establish a good air flow.

There may be books and box files in such good condition that they need not be sent to freezing facilities but can be dried in ambient conditions. On no account however should the drying be attempted in the location in which they were found because the environment will be totally unsuitable. They should instead be removed to a controlled environment while shelves, wall, floors, and ceilings are sterilized and necessary maintenance work is being done to return the site to its normal condition. If moved, materials should be stacked with air spaces between them provided that the drying area has a good circulation of air, together with airconditioning and dehumidification. If air-conditioning is not available, fans and dehumidifiers should be used to keep air moving and to extract moisture from the area. The relative humidity of a drying area is no guide to the actual moisture content of cellulose materials. The normal water content of paper is between 5 and 7 percent by weight. Materials which feel relatively dry to the touch as they come out of a humid, flood-damaged area, may actually contain moisture from above 10 to 20 percent.

Heat is one of the best means of drying, but since it increases the risk of mold development on humid books and documents, it should be used only if a good circulation of air and dehumidification can be established. Hygrothermographs for recording temperature and relative humidity should be installed to monitor the general area, and moisture-content meters used to measure the moisture in the materials themselves.

## **CLEANING AFTER A RIVER FLOOD**

The safest time to clean materials is after they have been dried. If water-damage is the result of a river flood then the following might, under certain circumstances, be considered. The Florence experience demonstrated that the best time to remove mud was after the books were dry. However some books did benefit from partial cleaning in the wet state. If adequate assistance is available, mud deposits on books which will not be further damaged by water may be washed off in clean, running water. Closed books may be held, one at a time, under water and the excess mud removed with a hose connected to a fine spray head. Similar washing should not be attempted with opened volumes, manuscripts, art on paper, or photographs.

Rubbing and brushing should be avoided, and no effort be made to remove oil stains. Anything which is hard to remove is better left until after drying, when techniques for removal can be worked out during the restoration stage. In some cases, printed books bound in cloth or paper can be left immersed in clean running water for as long as two weeks. Although this should be avoided if possible, it is preferable when the only alternative is leaving such books in warm, humid air while awaiting attention.

## **THOROUGH WASHING TO REMOVE HEAVY DEPOSITS OF MUD**

A more thorough washing procedure, intended to remove as much mud and slime as possible from books, requires six to eight tanks big enough to accommodate the largest volumes in the collection. This process is obviously wet and messy and needs to be set up outdoors in fair weather or in an area fitted out to use and remove large quantities of water. Since large quantities of water are required, the area will be wet and dirty throughout the operation, and good drainage is therefore essential.

Any rustproof receptacles may be used if they are large enough, but plastic garbage cans (20 or 30 gallons) are recommended. Each can should be equipped with a hose to provide low-pressure, continuous water flow to the bottom so that dirty water, as it overflows the rim, will be constantly replaced by fresh. Each hose should be fastened securely to prevent damage to the books being washed. Wooden duckboards, rubber boots, gloves and aprons are recommended for the protection of workers.

Keeping a book tightly closed, a worker should immerse one book at a time in the first can and remove as much mud as possible by gentle agitation under the water. Workers should not use brushes and or any tool which would cause an aggressive rubbing action. Books should be passed from one can to the next and the same operations repeated until most of the mud has been removed. At the last can, books should be rinsed by spraying them gently with a fine stream of water. No effort should be made to remove mud which continues to cling after sponging under water. This is much better done when the books are dry.

Finally, excess water can be squeezed from books with hands pressure; mechanical presses should never be used. It must be emphasized that the above procedure should be attempted only by a carefully instructed team and in a properly fitted-out area. If there is any doubt about the ability of the team to follow directions, washing should not be attempted. There are many classes of books which should not be washed under any circumstances, and it is therefore imperative to have the advice of an experienced book conservator who can recognize such materials and who understands their treatment requirements.

## **PRINCIPLES OF STABILIZATION BY FREEZING**

The most generally accepted method of stabilizing water-damaged library and archival materials before they are dried is by freezing and storing at low temperatures. This buys time in which to plan and organize the steps needed to dry the material and to prepare a rehabilitation site and the building for return of the collections after drying. Freezing provides the means for storing water damaged material safely and for

an indefinite period of time in similar physical condition in which they were found, preventing further deterioration by water and mold while awaiting treatment.

Freezing is not a drying method, nor can it be expected to kill mold spores, but it is highly effective in controlling mold growth by inducing a dormant state in the spores. If mold damaged material is frozen it is important that the drying method chosen must prevent mold spore activity during the drying process. For this reason it is important to segregate such material during removal and packing operations.

Stabilization by freezing also provides important advantages when it is not possible to immediately assess the value of the damaged materials or to determine which items can or cannot be replaced. In other words, stabilization gives time in which to estimate recovery costs, to prepare adequate environmental storage conditions, and to restore the building. In some cases, it may be necessary to restore or rebuild the original facilities - a process which can require a long period of time.

Had freezing technique been used after the catastrophic Florence flood in 1966, thousands of additional volumes could have been saved completely or would have suffered significantly less damage. The Florentine libraries which sustained the greatest losses contained mostly 19<sup>th</sup> and 20<sup>th</sup>-century materials. In these collections, losses were heaviest among books printed on coated stock, whose leaves stuck together during drying and could not be separated afterward. These losses could have been largely prevented if the materials had been frozen while wet, and if drying methods now known had been used to prevent adhesion of the leaves.

The effect upon freezing water soaked volumes which have lost their shape or have had their binding structures damaged by immersion, will be to slightly increase the thickness of volumes by the physical action of ice crystals, but this additional increase in thickness has been found to contribute no significant problems to already damaged books. Studies conducted by the Research and Testing Office of the Library of Congress have uncovered no evidence of any damage to cellulosic and proteinaceous materials caused solely by the action of freezing.

Freezing as a salvage method has other advantages. It can stabilize water-soluble materials such as inks, dyes, and water stains etc. which would otherwise spread by wicking action if they were dried from the wet state by conventional drying methods. Freezing provides the means by which water-soluble compounds will remain stable during a freeze-drying process which involves the removal of water by sublimation. This is the only known drying method capable of drying without further spreading of water soluble compounds, provided that the frozen state of the material is maintained before and throughout the drying process.



## COLD TEMPERATURE STORAGE CONDITIONS

The size and formation of ice crystals is governed by the rate and temperature of freezing. Blast freezing used for certain types of food-stuffs is designed to quickly freeze in a few hours, often involving temperatures in excess of -50 degrees Celsius. The advantage of quick freezing is that ice crystals are kept very small, resulting in a limited amount of swelling. Availability of blast freezing facilities may not be possible following water damage, so in normal circumstances, freezing will be slower and therefore the formation of ice crystals larger, but this should not cause problems for the majority of library and archive collections.

Once frozen, cold temperature conditions should be maintained at about 0° Fahrenheit (-18° Celsius). Lower temperatures will do no harm but higher temperatures may increase the size of ice crystals.

## PREPARATION FOR FREEZING

Before freezing, it may seem tempting to wash away accumulated debris particularly if this is the result of a river flood, but this is rarely advisable or safe because of lack of time, skilled workers and a pure water supply, and the quantity of material to be handled. (Aqueous washing to remove smoke damage should never be attempted under any circumstances).

Washing should never be attempted by untrained persons as this will cause further damage, nor should time be taken for this purpose if so little skilled help is available that any significant delay in freezing the bulk of the materials would result. The washing of materials containing water-soluble components, such as inks, watercolors, tempera or dyes should not be attempted under any circumstances.

Experience has shown that such materials, as well as those that are fragile or delicate, can be seriously or irreparably damaged by untrained workers attempting to clean and restore on-site. Such materials need expert attention and hours of careful work if damage is to be kept to a minimum. The period of emergency action and first aid is a dangerous and unsuitable time for the careful work required to restore materials to near-original state. The general condition of the damaged material will determine how much time can be spent in preparation for freezing. At the very least, bound volumes should be wrapped with a single fold of freezer paper, or silicone paper, if it is likely that their covers will stick together during the freezing process.

All rare, intrinsically valuable and delicate material should be prepared for freezing separately from other materials and also in separate categories so that each can be located and identified before they are dried. Each category may require a different type of drying than used for the other less sensitive materials. For instance, early printed books and manuscripts are made up of a variety of material including vellum, leather, paper, wood metal, ivory, inks and water color media. Others will be delicate and or highly water sensitive. These will need to be dried very carefully and if freeze-drying is used it should be undertaken with the minimum amount of internal chamber heating. If only a few items are involved it may be preferable to send them directly to a certified conservator for immediate treatment.

## CONTAINERS AND METHODS OF PACKING FOR FREEZING

The choice of packing containers should be carefully considered. Although corrugated board boxes are cheaper to purchase, locate and store on site than plastic type milk crates, they may restrict the rate and efficiency of drying and also be prone to collapse when filled with wet material. If it is possible to decide in advance what method of drying is to be used, be guided by the technical requirements of the vendor's drying system. For instance, if freeze-drying is to be used, one cubic foot plastic milk crates might be preferred, since these provide open spaces within the interlocking crates to aid in the efficient out-gassing of ice by sublimation.

With some forms of vacuum drying where sublimation does not occur, corrugated boxes may be quite suitable, depending on the location of the heat source in the chamber. In either case, containers should not be larger than approximately one cubic foot, to avoid excessive weight, a vital consideration for workers removing material from site and also to help reduce damage from collapsing boxes. Usually boxes will be prepared for freezing on pallets and this is where the weight of heavy wet boxes can collapse and cause additional damage to material within the pile. To avoid this, use plastic milk crates or very sturdy corrugated boxes for the wettest material and re-box file records if their original boxes are saturated with water. Endeavor to use one size and type of box. If this not possible, do not mix sizes when packing on pallets. The number of boxes per pallet should be no more than can be supported without collapse.

Although faster freezing and drying will result if boxes are not packed tightly, the contents will distort during the drying operation. To achieve the best drying results for books, they should be packed closely together so that drying is done under some restraining pressure. A book should never be packed fore-edge down as the weight of the text block will cause an inversion of its natural round shape. Pack books spine-down or flat and avoid placing larger volumes on top of smaller ones to avoid sagging which will be costly to correct during restoration.

The decisions taken at this stage will greatly affect the outcome and costs of the processes used for cold storage, drying and restoration. It has, unfortunately, not been sufficiently appreciated in the past that care in packing at this stage will significantly reduce post-recovery costs.

High costs certainly occur if boxes are stacked on pallets in mixed sizes which will increase the potential for collapse under the weight of water, crushing and damaging the material in the process.

It should be possible to move the wet materials directly from library to freezing facility, preferably in refrigerated trucks which can be drawn up to the loading site. For small collections of books and documents, dry ice may be used to freeze the material for transport in un-refrigerated trucks to long-term freezing facilities. (Gloves should be worn at all times when handling dry ice).

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## "part8" VACUUM AND FREEZE DRYING TECHNOLOGIES

It is important to understand that the processes used by vacuum and freeze-drying companies differ considerably depending on the specific requirements of the material to be dried. The majority of these companies have developed their technologies for food. Few have had experience in drying paper and books and therefore may not know if their normal operating system would be safe, or cost effective for this purpose. Freeze-drying has a number of significant advantages over vacuum drying since water remains in the frozen state during sublimation, a process which removes water from the solid state to the gaseous state. This avoids most of the problems associated with expansion, sticking and wicking of water sensitive and soluble media. Vacuum drying, generally considered to be a process that changes a liquid to a vapor, will result in a much greater risk of expansion, distortion, sticking, and staining.

Although both drying methods have been found to produce satisfactory results in a number of disaster recovery events, comparison between the two following a disaster has not been made. Our preference is for freeze-drying because it is the least aggressive of the two methods. However, there are situations where for instance, archival documents have been affected and where there is a low percentage of intrinsically valuable material, where vacuum drying has provided satisfactory results. The choice between the two should be governed by the nature, value and condition of the damaged material. Rare collections of significant value need to be dried with due regard to the sensitivity of the substrate and media and it is for this reason why we suggested earlier that such materials be segregated from the less rare.

Freeze-drying which is used to dry animal specimens, does so at very low internal chamber temperatures, lower than is used for most food processes. One animal specimen may take several weeks to dry. At this slow rate of drying the costs are high. Most paper and book material can withstand higher temperatures than those used to dry delicate animal specimens and there is a need for thermal energy to make the process efficient and cost effective.

If a vacuum or freeze-drying chamber is designed to operate with internal chamber heat sources, these must not touch the material to be dried, to avoid over heating and scorching. The internal temperature of a chamber should be no greater than 100 degrees Fahrenheit (37.8 degrees Celsius). For sensitive materials, including early book material where there is a mix of paper, vellum leather and wood etc., below ambient temperatures or those used to dry animal specimens should be used, to dry the material slowly and under carefully monitored conditions. (Note: In specifying an upper limit of 100 degrees Fahrenheit we consider this to be a safe temperature. There is insufficient data at this time to evaluate the effects of higher temperatures).

It is important to realize that the success of any large drying system depends on the ability of the system to stop the development of mold during and after the drying process. Be aware of the risks in accepting material returned from commercial drying processes unless there is a guarantee that none will be returned damp or wet. If mold develops after return, it may not be possible to detect it, if the material remains boxed. If care was taken to segregate mold-contaminated from non-contaminated items during recovery, boxing and freezing, this will help determine if the drying was carried out properly. If mold develops in the non-contaminated material, the chances are that either the drying was not done correctly or that drying was not complete.

Mold-infected material, if dried completely under freeze-drying conditions, can be safely controlled for a short period of time, so that the spores remain quite dormant if stored after drying in an air conditioned environment maintained at 50 to 55 degrees Fahrenheit and a relative humidity of 35 percent or lower. However they must not be returned to the library or archive shelves until the mold contamination has been treated. For this reason we recommend that at the end of the drying cycle and while still in the drying chamber all mold-contaminated material be sterilized. If extreme care was not taken to separate contaminated from non-contaminated materials before the drying operation, we recommend that each drying load be sterilized.

## **"part9" EVALUATION OF LOSS**

When a flood or fire-damaged collection is covered by insurance, full settlement of a claim cannot be realized until the lost and damaged materials have been listed and their values established. The extent and success of possible restoration must also be determined. In the event that a claim is anticipated as a result of such damage, every item should be salvaged, frozen, and dried. After drying, the affected materials should be shelved in a specially equipped environmental storage area, isolated from the main stacks, and there inspected and monitored over a period of time. Such a policy is the best guarantee of sound judgments by custodians, consultants, and adjusters when they must calculate the degree of loss as a basis for compensation.

## **SUMMARY OF EMERGENCY PROCEDURES**

Seek the advice and help of book and paper conservators with experience in salvaging water-damaged materials as soon as possible.

Turn off heat and create free circulation of air.

Keep fans and air-conditioning on day and night and use dehumidifiers and insure a constant flow of air is necessary to reduce the threat of mold.

Brief each worker carefully before salvage operations begin, giving full information on the dangers of proceeding except as directed. Emphasize the seriousness of timing and the priorities and aims of the whole operation. Instruct workers on means of recognizing manuscripts, materials with water-soluble components, leather and vellum bindings, materials printed on coated paper stock, and photographic materials.

Do not allow workers to attempt restoration of any items on site. This was a common error in the first 10 days after the Florence flood, when rare and valuable leather and vellum-bound volumes were subjected to scrubbing and processing to remove mud. This resulted in driving mud into the interstices of leather, vellum, cloth, and paper, caused extensive damage to the volumes, and made the later work of restoration more difficult, time consuming, and extremely costly.)

Carry out all cleaning operations, whether outside the building or in controlled environment rooms, by washing gently with fresh, cold running water and soft cellulose sponges to aid in the release of mud and filth. Use sponges in a dabbing motion; do not rub. These instructions do not apply to materials with water-soluble components. Such materials should be frozen as quickly as possible.

Do not attempt to open a wet book. (Wet paper is very weak and will tear at a touch. One tear costs at least one dollar to mend!) Hold a book firmly closed when cleaned, especially when washing or sponging. A closed book is highly resistant to impregnation and damage.

Do not attempt to remove mud by sponging. Mud is best removed from clothes when dry, this is also true of library materials.

Do not remove covers from books, as they will help to support the books during drying. When partially dry, books may be hung over nylon lines to finish drying. Do not hang books from lines while they are very wet because the weight will cause damage to the inside folds of the sections.

Do not press books and documents when they are water soaked. This can force mud into the paper and subject the materials to stresses which will damage their structures.

Use soft pencils for making notes on slips of paper but do not attempt to write on wet paper or other artifacts.

Clean, white blotter paper, white paper towels, strong toilet paper, and unprinted newsprint may be used for interleaving in the drying process. When nothing better is available, all but the color sections of printed newspapers may be used. Care must be taken to avoid rubbing the inked surface of the newspaper over the material being dried; otherwise some offsetting of the ink may occur.

Once access to the collection is gained, the external appearance of each volume and group of volumes is a useful indication of the degree of water damage. Those volumes found, usually in heaps, in the aisles will naturally be the most damaged. Not only will they have sustained the shock of falling, as rapid swelling caused them to burst from the shelves, but they will also have been exposed to water for a longer period than the volumes on the shelves above them. These will need special, flat packing and the most extensive restoration. The appearance of such volumes can be a devastating, emotional experience, but one must not panic since every volume worth the cost of salvage and restoration can be saved.

Above the floor levels there will be distinct signs among the shelves of the locations of the wettest material. Shelves which have expanded under the pressure of swollen paper and bindings will usually contain a mixture of evenly wet as well as unevenly wet material. The proportion of evenly wet material in these situations is usually less than those that are unevenly wet.

This is because books, originally shelved closely packed together, will not easily be completely saturated especially if the paper is slow to absorb. This is the major reason why so many books become misshapen and distorted after water damage and also after they have been frozen and dried. If paper is unevenly wet, it will not dry without distortion. Misshapen volumes with concave spines and convex fore-edges can be immediately identified as belonging to the category of very wet. Others that have severely swollen text blocks but that still retain some spine and fore-edge shape may indicate that they were previously bound with library binding oversewing techniques and may have sustained irreversible sewing structure damage. Others may be relatively sound in shape and these stand the best chance of drying with the minimum of distortion.

**URL: <http://www.nara.gov/nara/preserva/primer/eng>**

**Last updated: August 15, 1996**

## REHABILITATION AFTER DRYING

If maximum benefits are to be gained from stabilization by freezing, every effort should be made, first, to identify and assess the value, condition, and total numbers and types of materials damaged, and second, to draw up comprehensive lists of those materials which can be replaced and those which should be reclaimed and restored. Replacement is nearly always cheaper than restoration. Volumes to be reclaimed will need to be evaluated in terms of the amount of restoration needed and probable costs. The best time to make such judgments, if a disaster preparedness plan does not exist, is after the volumes have been dried and before they are returned to the library or archive shelves.

The following represent basic steps that need to be taken after drying in order to begin returning the material to normal housing environments.

Unless a drying company can guarantee in writing that no material will be returned boxed if it has a water content exceeding 7% by weight, there is a high possibility that some boxes will contain damp material that will add to the risks of post drying mold development, and which, if allowed to develop, will quickly spread to other uncontaminated material, if left unchecked and therefore undetected.

It is important when preparing specification for a drying contract that acceptable water content is not specified as an average of a books total water content. For instance the text block of a book may be measured at far less than 7% but the water content of the book cover boards may contain higher 7% of water. Therefore it is necessary to specify that the waters content of all the books composite materials be less than 7%.

Do not store the material in un-opened boxes immediately upon return from the drying facilities, even if this seems to be the most convenient action to take.

All books and paper file records should be unboxed and placed on open shelving in a well ventilated, air-conditioned rehabilitation area, well separated from the main collections. The rehabilitation area makes it easier to assess the condition of the dried materials, as well as to identify those that can be replaced and those that must be cleaned and restored.

A carefully organized, random inspection of mold- infected materials should be conducted daily by personnel trained to carry out this important task.

Whether materials have or have not been sterilized during the drying process, it is necessary to monitor their behavior as a check against the effectiveness of drying and sterilization and to identify any potential for mold growth and to take the appropriate action, before the return of these materials to the main collections.

We are concerned here with monitoring the dried volumes while they are in the rehabilitation area, and after their return to the main stacks. This monitoring should be continued at regular intervals for at least a year after they are returned to the main library shelving.

In preparing the rehabilitation area, provide about twice the number of shelves as would be needed for normal book requirements. This will compensate for the effects of distorted and expanded books and provide sufficient air space to allow the material to regain their moisture equilibrium content which, depending upon circumstances, may take a week or two.

Theoretically, equilibrium moisture regain can be accomplished at the end of a drying run while the material is contained in the drying chamber. The chamber can be back filled with moisture to achieve the desired result. However this is only possible and safe if the drying method has been guaranteed to dry the material completely. If there remains some partially damp material at the end of a drying run, back filling the chamber with moisture would make such material more vulnerable to mold growth.

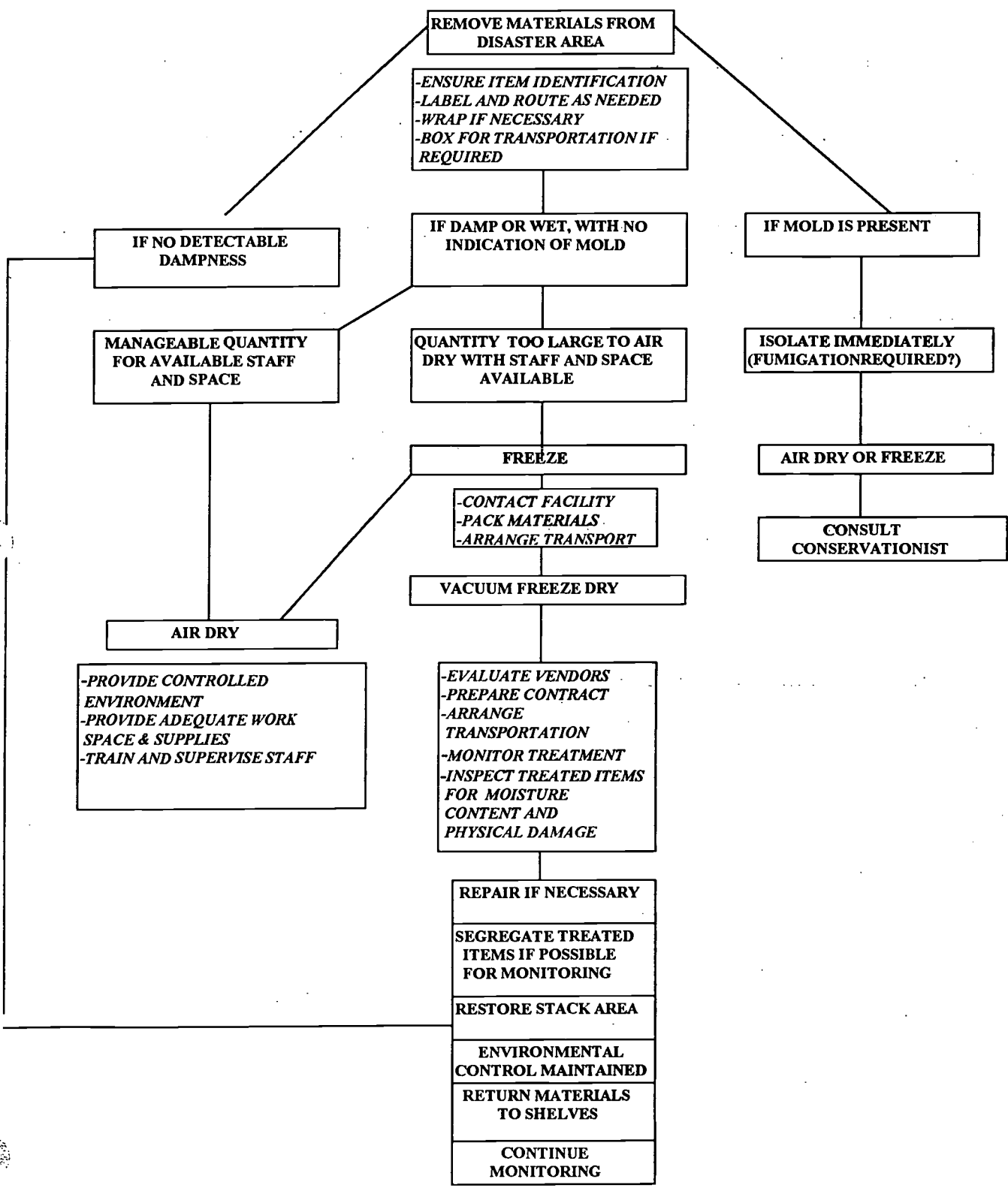
The rehabilitation area should be maintained at a relative humidity of 30 to 40 percent and a temperature of less than 65° Fahrenheit. Both humidity and temperature controls must be adjustable.

It is desirable to maintain the collection in the rehabilitation area for a period of at least six months. At this time, temperature and humidity in the rehabilitation area can be gradually changed to duplicate conditions in the stack areas to which they will be returned. At the end of this time, if no mold growth has occurred, the volumes can be returned to the main stacks and monitored as indicated above. It is highly

desirable but usually not practical to leave volumes in the rehabilitation area for an added six months in an environment that duplicates normal stack conditions, as a check against post drying mold growth.

No materials should be returned to the main library shelves without very careful inspection, and preferably not before all necessary cleaning and restoration has been completed.

**TREATMENT OF WATER DAMAGED BOOKS AND PAPERS**





ENDNOTES

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          (Waters, 1996, part 5)
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