Surveying the Stacks

Collecting Data and Analyzing Results with SPSS

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In fall 2002, the University of Tennessee Preservation Office conducted a condition survey of circulating materials in the school's John C. Hodges main library. The objective of the collection condition survey was to evaluate the physical condition of the collection and the effect of human and environmental factors in order to develop a long-range preservation plan. The project used a random sampling method, and a database and online survey form created with SPSS software. The results of the survey contribute an understanding of the national preservation picture. Locally, the results indicate action should be taken in several areas, including environmental conditions, staff and patron education, and reformatting. Other libraries in the early stages of establishing a preservation program can employ the techniques used in Hodges Library to develop their own preservation plans.

Over the last twenty-five years, the challenges of preserving libraries' collections have been well documented, and techniques for preserving library materials have been put to the test, improved, and shared with librarians around the world. In major university libraries, preservation programs that once concentrated on binding and book repair operations have advanced to include state-of-the-art conservation facilities and digital reformatting expertise. Those involved with preservation in the last two decades developed techniques and solutions for dealing with everything from torn pages to brittle books. Preservation professionals can prevent many types of damage and apply treatments with confidence, but the resources to do everything needed are seldom available. Therefore, libraries have developed long-range preservation plans with strategies for identifying and organizing priorities. As Matthews states, "Preservation activity needs to be planned and managed like any other library activity."[1] A collection condition survey is a logical and relevant starting point for preservation planning in any library. Walker writes, "A condition survey of the collections will provide the most significant information relative to the development of a preservation program."[2] Although large libraries have led the way in developing condition surveys, such studies have become feasible even for small libraries. New technologies have increased the flexibility of the traditional process for surveying collection condition.

In the 1970s and early 1980s, several libraries with pioneering preservation programs conducted surveys of their collections in an attempt to determine the overall condition of those collections and to prioritize preservation problems. In 1979, Stanford University conducted a landmark study of the Green Library, which determined that 32.8 percent of its collection was in good condition, 40.8 percent was in moderate condition, and 26.5 percent was in poor condition.[3] For this survey, Stanford developed a methodology that could be applied elsewhere, and that has proven useful to other libraries. The following year, Yale began a large-scale, comprehensive survey of its collections. The Yale survey found 82.6

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percent of the collection to be acidic; however, only 12.8 percent of the collection was found to need immediate attention.[4] A few years later, a Syracuse University Libraries survey revealed a similar percentage of acidic volumes, finding 87 percent of the collections to be acidic.[5]

Libraries continue to adapt and build upon the methodologies developed in these early collection condition surveys. In 1996, the University of Kansas Libraries conducted a survey using methodologies similar to the Yale and Stanford surveys, incorporating modern computer software technology for collecting and analyzing the data.[6] Some libraries, such as the University of Illinois at Urbana-Champaign, have completed two collection condition surveys of the same collection, comparing the results of the first survey to a second set of data collected several years later. The results of the second survey at the University of Illinois at Urbana-Champaign provided insights into the consequences of deferred collections care.[7] At the conclusion of these and other surveys, the researchers often shared their methodology, results, and conclusions through published articles.

An important benefit of publishing collection condition survey results is that the information gives other preservationists the opportunity to compare the outcome to their own institution, an exercise that both validates local results and highlights telling differences among institutions. In 1992, Nickerson published an article comparing surveys at Brigham Young, Yale, and Syracuse Universities.[8] Nickerson focused on pH and brittleness of the surveyed collections, finding some striking similarities and differences. While the acidity levels at the three collections are quite similar, Brigham Young University found far fewer brittle materials in its survey, leading Nickerson to surmise environmental factors were very different for the collections in the three institutions. Nickerson also observed that comparing data across institutions is difficult when different protocols are employed. Yet, sharing the information with colleagues at other institutions is an important contribution to the advancement of preservation. Each new study includes additional aspects, such as the use of computer hardware and software. Sharing new methodologies and information about the use of new software with colleagues is essential to the continued development of preservation practices. Often, specifics about methodologies are what other libraries need when beginning to develop their own surveys. In his recently published book, Baird described a methodology for collection condition assessments in small academic and public libraries.[9] Such publications provide important practical direction.

The University of Tennessee

The University of Tennessee conducted a collection condition survey in 2002 as the basis for developing a long-range preservation plan. Results of the study have contributed to determining strategic priorities. The University of Tennessee has a graduate and undergraduate population of approximately 27,000 students. The library holds a mid-sized research collection of approximately 2.2 million volumes. While the surveys at Stanford, Yale, and Kansas were being conducted, the University of Tennessee preservation program was in its infancy. Similar to the University of Illinois experience described by Teper and Atkins, the University of Tennessee Libraries made attempts to lay the groundwork for a centralized preservation program throughout the 1980s and 1990s.[10] Committees in the library conducted studies, initiated a disaster preparedness program, and developed a preservation plan, yet the preservation program made little progress in fifteen years. A binding unit had been in place for decades and continued to operate throughout that time. The library started a minor book repair program in the mid-1990s, but structured preservation took a backseat to other library initiatives. Little progress was made until 2000, when the library hired its first preservation librarian with a mandate to develop a coordinated preservation program. Although Tennessee's preservation program began years after those at Yale and Stanford, published collection condition survey results were helpful in planning and developing a local study.

The Preservation Office of the University of Tennessee Libraries surveyed the circulating materials in the stacks of the John C. Hodges Library, the campus main library, in the fall of 2002. The survey team consisted of the preservation librarian, an information sciences graduate student, two full-time preservation staff, and three undergraduate student assistants. All participants in the survey team were experienced in conservation work. Once underway, the survey took approximately two months to complete, running from October through November 2002. During each phase of the project, the survey team consulted with the Preservation Advisory Group (a committee of library faculty and staff who help establish priorities for the preservation program) to set and meet the survey's objectives. The primary objective was to evaluate the physical condition of the library's holdings and the effect of environmental and human factors on the collection. A secondary objective was to develop a methodology that could be used to repeat the survey at the branch libraries. The results of the survey are being used to develop and implement a long-range preservation plan for the library.

Hypotheses

Before beginning the study, the surveyors had some general expectations about what the results would be, based on personal experience and anecdotal evidence. A major consideration was the architectural design of the library.

Hodges Library was built in 1987 with little design consideration given to the preservation of the materials it would house. Hodges Library is an unusual structure of modern design, and the building floor plan reflects greater emphasis on esthetics than on function. Designed in a geometric series of open terraces, the building has fifty-three flat roofs and a labyrinthine stacks layout. Flat roofs collect more water than pitched roofs, and leakage is a recurrent problem throughout the building. Heavily used study areas, shelves, walkways, and windows compete for space in the stacks. Large tables that students use for studying and socializing are adjacent to some bookshelves. The survey team observed that materials facing walkways exhibited increased wear and stacks were subjected to litter and contained misshelved volumes. Four hundred and fifty windows in the stacks allow ample natural light to penetrate the interior. While pleasant for people, the ultraviolet (UV) light from the sun is very damaging to library materials.[11] There are no UV filters or covers on the windows in the stacks, and no buffer area exists between the windows and the shelving. Considering the numerous windows in the library's stacks, the survey team expected to find a high rate of UV-damaged volumes.

The survey team and library employees alike had noticed a large number of volumes in the stacks were shelved poorly. Limited numbers of circulation staff cannot keep all of the books shelved neatly and correctly; some heavily used sections of the stacks have a reputation for being in constant disarray. The surveyors, therefore, hypothesized that a high percentage of volumes would be out of order or shelved improperly. Another general belief held by the surveyors was that a high number of books would have pictures and pages cut out, especially in the photography and art sections. Every library struggles with this dilemma, and the surveyors hypothesized that a high number of volumes would be deliberately mutilated.

The surveyors also had assumptions about environmental damage in addition to UV. Because the library has devoted very little time in recent years to dusting or vacuuming the books in the stacks, the group expected a high number of books with considerable dust. Despite the flat roofs, the survey team anticipated relatively little water damage or mold. Everyone in the library, especially the stacks and maintenance crews, is extremely vigilant in protecting the materials and bringing out rolls of plastic sheeting when the library's collections are threatened. When books are water-damaged, which is surprisingly seldom, they are usually found and treated or replaced immediately, leaving little time for mold to grow.

Connecting the issues of shelving and environment, the group wondered if any correlation would be seen among shelf height, environment, and incorrect shelving. The group hypothesized that books on the bottom and top shelves would be more likely to have environmental damage, be poorly shelved, or both.

Methodology and Procedures

The collection to be assessed consisted of 1,594,652 volumes, the entire circulating collection in Hodges, including bound periodicals, serials, and monographs. With the assistance of a systems librarian and a university statistician, the survey team determined that a survey of 700 volumes would provide a statistically significant sample. The team discussed two methodologies for selecting a random sample from the stacks. The first option was to count ranges, shelves, and books in the stacks, essentially pulling every nth book. The second option was to draw a random sample from the catalog. Because the time required to count books in the stacks would have been formidable, the surveyors selected the second option. A systems librarian generated a random sample of 700 volumes from the catalog's database. The survey group solved the potential problem of missing volumes by deciding to pull the book directly to the left of where the missing volume should be shelved, thus neutralizing the issue of whether a book was checked out, missing, or lost.

One initial concern when planning the survey was the choice of appropriate database software. The surveyors consulted the university's Statistical Consulting Center for advice on both survey methodology and survey form creation. The survey planners considered using Microsoft Access due to its availability and its use in similar surveys, but decided to use the Statistical Package for the Social Sciences (SPSS), a statistics and graphics software package designed for statistical research. The SPSS suite of survey design software better met the needs of the preservation survey with its advanced analysis capabilities and adaptability to online use. An important advantage of the SPSS software is the ability to control the accuracy of responses with a tool called "Rule Wizard," which can be set to prevent illogical answers and reduce mistakes. For example, Rule Wizard, as used in this survey, did not allow more than one digit to be entered in response to the shelf-height question or more than four digits for publication year. The form was designed to skip unnecessary questions based on responses to earlier questions. If a surveyor responded that the item was shelved correctly, the form skipped the question about *how* the item was incorrectly shelved. The survey form incorporated different types of response options based on appropriateness to the needed data. Questions for which more than one response was possible allowed the surveyor to check as many answers as applied, while questions for which only one response was needed permitted only one selection, a feature that reduced errors.

Surveyors could use any computer with Internet access to complete the form without having to download any

software. Another advantage of using an online form was that all the data entered was collected and stored centrally in a university computer server. Data gathered online was downloaded into SPSS for analysis of the results. Being able to access the survey online gave participants the option to carry a laptop with wireless Internet access into the stacks and enter findings as they located randomly designated books. Laptop use made the entire process more convenient for some of the survey team and circulation staff. Surveyors were not restricted to the Preservation Office hours of operation or computer availability, and circulation was not burdened with the sudden displacement of 700 volumes. Survey team members reshelved their target books after entering data. Transporting a laptop and survey implements through the stacks was more cumbersome than expected, but time constraints made it the only solution for some student surveyors who needed to access the form after the Preservation Office's business hours. However, many of the participants opted to load their assigned books onto a cart and return to the office and the relative comfort of a desktop computer, where they could use a mouse, barcode scanner, and number pad. Those who chose this option took notes about the location (such as shelf height, proximity to window) as they pulled the books.

Once the survey form was designed and online, three members of the survey team conducted a trial survey to identify and address problems with the procedures or the online form. A pilot sample of one hundred volumes was drawn from the catalog, and the surveyors entered the information for these volumes onto the form. Overall, the trial went smoothly, but it did alert the team to some issues. For example, a question regarding brittleness of the text block was inadvertently omitted from the form on the pilot survey. The test run allowed the surveyors to spot this problem and insert the question before the survey. The results from the pilot survey were erased from the database before the actual survey took place and were not included in the results.

When the pilot was completed, the survey leaders, a graduate student, and the preservation librarian held a training session for the rest of the survey team (two full-time preservation staff and three undergraduate student assistants). During the training session, the group completed the survey form together for several books that had been pulled from the stacks. In this way, the group developed a common understanding of the range of answers for each question and the specific meaning of the terms used in the survey form. The team developed two documents as a result of the training session. The first (appendix A) provided definitions of terms used on the survey form, with guidelines for potentially ambiguous questions. For example, a volume not completely perpendicular to the shelf constituted a book that was not shelved straight. The second document (appendix B) explained and defined condition rankings. Because the survey included a question about the overall condition of the volume, surveyors were to provide a ranking of excellent, good, fair, or poor for each volume. A list of potential problems indicated the highest ranking that a volume could receive if it had any one of those problems. For example, a volume with acidic paper could never be any higher than "good," although it could be lower if there were other problems such as a broken text block, brittle paper, or water damage.

Survey Results

Each surveyor entered data for the volumes surveyed into an SPSS template via the online form. Data sets showed responses to each question, such as number of volumes shelved correctly. The software also allowed crosstab queries to compare answers to two questions, such as percent of books shelved correctly on the top shelves. To prove or refute initial hypotheses, surveyors generated reports that included both numbers and percentages for each question, along with the results from some crosstab queries. Data addressed physical conditions, such as binding and paper quality, and environmental factors, such as UV or water damage, as well as human factors, including shelving conditions and mutilation. Tables in the following sections reflect the condition factors assessed for each question.

Shelving

The manner in which a book is shelved not only affects access to it, but also its longevity. When a volume is shelved too loosely or tightly, on its foredge or on its spine, damage to the binding will occur. As shown in table 1, the survey found that 21.6 percent of the volumes in the stacks were shelved incorrectly. While that percentage translates to 151 volumes with shelving problems, some of these volumes had multiple problems. Thus, table 1 shows 162 shelving problems found in a total of 151 volumes. A breakdown of the problems shows that 5.4 percent of the volumes were shelved in the wrong location, 0.1 percent of the volumes were shelved on their spines, 0.8 percent were shelved on their foredge, and 3.7 percent were shelved too tightly. The most striking finding was that 13 percent were not shelved straight. In spite of the strict survey guidelines that may have caused this result, it confirms the hypothesis about poorly shelved volumes, along with the need for more shelving staff and training for those staff.

Damage to Binding and Text Block

The condition of a volume's binding and text block is often the reason it needs preservation treatment. Broken text blocks, damaged spines, and loose hinges all indicate the type of treatment a book will require and the resources it

will take to repair. With empirical data about the collection, librarians can wisely calculate the resources needed for binding and repair operations. Table 2 illustrates that 41.1 percent of the volumes in the survey had damage to the binding or text block. Some of the damaged volumes can be fixed in-house, with varying levels of conservation repairs. Other volumes cannot be cost-effectively treated in-house and must either be sent to the commercial bindery or to a conservation center if the content is to be preserved.

Environmental Damage

An important component to any preservation program is environmental control, which is preventive in nature. Often environmental control is limited to monitoring the temperature and relative humidity in the building, but other factors, such as ultraviolet rays, dust, water damage, and pest infestations, also threaten library materials. According to the survey, 30.3 percent of the volumes have some environmental damage, including damage inflicted by ultraviolet light, dust, and water. See table 3 for analysis of environmental damage. The surveyors considered a book to have UV damage if all or part of the volume's covering was faded. Frequently surveyors recorded that the spine of the book was lighter than its sides or boards, and, in some instances, the dark outline of a bookend was evident when the rest of the book covering was faded.

Proving the surveyors' initial hypotheses about windows and dust in the stacks, the most prevalent type of damage was due to ultraviolet light, found in 18.1 percent of the volumes. UV damage was followed closely by dust, which was found on 16.4 percent of the volumes sampled. No instances of mold or insect damage were found. With the right precautions, such as vacuuming the stacks and purchasing ultraviolet light filters, these types of damage can be prevented, saving the library considerable time and expense in the future.

pH of Text Block and Brittleness

The pH level of the paper in a volume is perhaps the single most important factor in determining the condition of a volume. If the pH is acidic, the paper will deteriorate and become brittle over time, eventually becoming unusable.[12] Good environmental conditions, including safe, stable levels of temperature and relative humidity, and minimal ultraviolet light, can slow the deterioration rate, but if left untreated, the paper will still turn brittle. The data (table 4) show that 68 percent of the volumes in Hodges stacks are acidic and are either already brittle or doomed to become so if they not deacidified.

Even when deacidified, the process by which paper is made brittle cannot be reversed once it has taken place.

Table 1. Shelving

	No. of occurrences	% of sample (n=700)
Location incorrect	38	5.4
Not shelved straight	91	13.0
Shelved on spine	1	0.1
Shelved on fore-edge	6	0.8
Shelved too tightly	26	3.7
Total shelving problems	162	--
Total volumes with shelving problems*	151	21.6

*Because several volumes had more than one shelving problem, total volumes with shelving problems is less than total shelving problems.

Table 2. Damage to binding and text block

	No. of occurrences	% of sample (n=700)
Broken text block	50	7.1
Missing covers	0	0.0
Red-rot leather	6	0.9
Damaged spine	128	18.3
Loose hinge(s)	177	25.3
Damaged cover(s)	73	10.4
Missing pages (not mutilation)	1	0.1
Damaged pages (not mutilation)	37	5.3
Loose pages	17	2.4
Torn endsheets	40	5.7
Loose cover(s)	7	1.0
Total occurrences	536	--
Total volumes with damage*	288	41.1

*Because several volumes had more than one binding and text block problem, total volumes with binding and text block problems is less than total problems.

Table 3. Environmental damage

	No. of occurrences	% of sample (n=700)
Mold	0	0.0
Ultraviolet light	127	18.1
Dust	115	16.4
Insect	0	0.0
Water	15	2.1
Total occurrences	257	--
Total volumes with damage*	212	30.3

*Because several volumes had more than one form of environmental damage, total volumes with environmental damage is less than total volumes with damage.

Brittle volumes are very fragile and often unusable, and must be either reformatted (microfilmed, photocopied, or digitized) or replaced with reprints if the information they contain is to be available for future use. The surveys tested the paper for brittleness using the double-fold method, creasing the corner of a page four times. If the paper breaks before or at the last crease, it is considered brittle. Of the

volumes surveyed, 16.6 percent are already brittle (see table 4). As with the information about damage to the binding and text block, this data about pH levels and brittle paper will help the library prioritize resources for possible deacidification and reformatting projects.

Table 4. pH of text block and brittleness

	No. of occurrences	% of sample (n=700)
Acidic vols.	476	68.0
Brittle vols.	116	16.6

Patron Damage and Mutilation

In order to distinguish between normal wear and tear on volumes, the survey designers created a separate question for damage caused by users through deliberate mutilation, ignorance, or neglect. While some patron damage is deliberate and malicious, much of it is done by those who are unaware that they are creating any damage or that the damage they are causing is time-consuming and expensive to fix. The data collected with this question (see table 5) will assist the library in determining what should be emphasized in user education programs. The types of damage and mutilation included in the questionnaire were pencil, ink, highlighter markings, paper clips, dog-ears, post-it notes, bookmarks or other papers left in the volume, pages torn or cut out, apparent animal damage, food or drink stains, and adhesive damage. Pencil markings ranked the highest (12.9 percent) of these in the results, followed by ink (8.1 percent). Perhaps the biggest surprise in this category for the surveyors was the low rate of deliberately torn or removed pages. Only one volume in the sample was recorded as having deliberately mutilated pages.

Table 5. Patron damage and mutilation

	No. of occurrences	% of sample (n=700)
Pencil	90	12.9
Ink	57	8.1
Highlighter	17	2.4
Paper clips	5	0.7
Dog-ears	47	6.7
Post-it notes	2	0.3
Bookmarks and other papers	21	3.0
Pages torn or removed	8	1.1
Animal damage	1	0.1
Food or drink stains	28	4.0
Adhesive	12	1.7
Other	17	2.4
Total patron damages	305	
Total volumes with patron damage*	182	26.0

*Because several volumes had more than one type of damage or mutilation, total volumes with damage and mutilation is less than total damage and mutilation problems.

Correct Shelving and Shelf Number

Using a crosstab query, the results of the survey were analyzed to compare shelving conditions and the shelf height. When pulling the sample volumes off the shelf during the survey, the surveyors noted the shelf height, with shelf number one being the bottom shelf and number nine the top shelf. During the analysis, the shelves were grouped together; table 6 shows that the uppermost shelves are more likely to be incorrectly shelved than the middle and lower shelves. Of the volumes on the bottom two shelves, 21 percent were shelved incorrectly, and similarly, 18.5 percent were shelved incorrectly on the middle three shelves. However, 29.2 percent of the volumes on the top three shelves were incorrectly shelved, a significant difference showing that the harder to reach shelves are more likely to be in disarray and need more attention from shelvers. This data support the original hypothesis that a correlation may exist between shelf height and the condition of the shelving. This finding will be helpful in training shelving staff.

Table 6. Incorrect shelving and shelf number

Shelf no.	Total volumes on shelves	No. Incorrect	% Incorrect
Shelves 1–2*	157	33	21.0
Shelves 3–6	389	72	18.5
Shelves 7–9	154	45	29.2

* Shelves 1–2 are the lowest two shelves.

Environmental Damage and Shelf Height

Shelf numbers were compared to the environmental damage (see table 7). The survey found no significant environmental damage difference among the shelf heights, arguing against the hypothesis that the shelf height may be a contributing factor to environmental damage. This may negate concerns about ultraviolet light damage from the ceiling lighting, but more investigation is required.

Overall Condition

One of the last questions on the survey form asked about the overall condition of the volume. One of four categories was checked for each volume, and the rankings were based on the condition rankings guidelines found in appendix B. Results are presented in table 8. "Good" was the most common condition, with 48.6 percent of the volumes. The sec-

Table 7. Environmental damage and shelf number

Shelf no.	Total volumes on shelves	No. damaged	% damaged
Shelves 1–2*	157	50	31.8
Shelves 3–6	389	115	29.5
Shelves 7–9	154	47	30.5

* Shelves 1–2 are the lowest two shelves.

Table 8. Overall condition of volume

	No. of volumes	% of sample (n=700)
Excellent	193	27.5
Good	340	48.6
Fair	118	16.9
Poor	49	7.0

ond highest ranking was "excellent," followed by "fair," and then "poor."

Discussion

Overall, the results of the survey support many of the initial hypotheses. A high percentage of volumes have UV light damage: 18.1 percent of the volumes showed damage from UV light, a very large number when compared to the data from the Yale survey, in which only 3.9 percent of the volumes had any environmental damage at all.[13] The data from Hodges also showed that 16.4 percent of the collection was dusty, a number that reinforces the hypothesis that a significant percentage of the volumes in the stacks were dusty. Another hypothesis (low occurrence of water damage and mold) received confirmation in the survey. A mere 2.1 percent of the volumes surveyed were damaged by water, and no volumes had any sign of mold. The hypothesis that shelf height and shelving condition were correlated was also supported by the data. While 78.6 percent of all volumes were shelved correctly, only 70.8 percent of the volumes on the top three shelves were shelved correctly. The middle four shelves ranked the best, with 81.5 percent shelved correctly, and 79.0 percent of the volumes on the bottom two shelves were correctly placed.

Some results were surprising. Data did not support the hypothesis that shelf height would correlate with environmental damage. The survey did not record a high percentage of mutilated volumes. While 26.0 percent of the volumes had patron damage, most was pencil and ink markings, which deface the volumes but do not typically prevent access to the information they contain. Only 1.1 percent of the volumes in the survey had pages deliberately torn or removed.

With empirical data in hand to either support or refute hypotheses, the library is now able to decide what steps are necessary to combat the problems indicated by the data. The results suggest the need for two groups of desirable actions: preventative and restorative. Preventive actions should address shelving practices, patron damage, environmental conditions, and the paper's pH level. Staff and user education programs help prevent damage to books caused by improper shelving and careless patrons. The major resource needed in staff and user education programs is time. Making education a priority will prevent some of the avoidable damage to the library's holdings. Improving the environmental conditions of the library's stacks requires funds to purchase ultraviolet light filters for the numerous windows in the stacks. In addition, more time must be devoted to cleaning the stacks in order to reduce the dust.

More funding is necessary to prevent acidic volumes from becoming brittle. Unlike educating staff and users or improving environmental conditions, which benefit the entire collection, deacidification involves handling each item. Thus, the expense is greater than addressing training or environment. Before a deacidification program is begun, librarians must develop and prioritize lists of collections or subject areas where deacidification would be most beneficial. Such a project will require additional funding.

Actions taken to address damaged and brittle volumes are restorative. These actions are item-level preservation work, with each volume requiring individual attention. Damaged volumes that are not brittle can be repaired in the library's conservation lab or sent to a commercial bindery for rebinding. The volumes that are brittle will require replacements or reformatting through microfilming, preservation photocopying, or possibly digitization. Another option for the brittle volumes is to withdraw them from the collection when they are no longer usable. All of these options require resources, so the library must determine priorities for funding and staff time to accomplish these restorative activities.

After completing the Hodges Library survey, the team leaders presented the results to colleagues. To put the results into context, presentations included comparisons of the Hodges survey data to results from other libraries. For example, the Hodges survey found 16.6 percent of the volumes in the survey to be brittle, considerably less than the data from the Yale survey, which showed 37.1 percent brittle, but more than in the Kansas survey, in which 9.7 percent of the volumes were brittle.[14] The data from these surveys do not point to any reason for the differences, but, as environmental conditions play an important role in the deterioration of paper, the comparative data aids local understanding about the severity of the problem. Given the wide variation between the

Kansas and Yale data, the University of Tennessee could not have estimated the percentage of brittle volumes in Hodges Library simply by studying survey results from other libraries.

UT's preservation survey team has applied the same methodology and analysis to assess collections in the Agriculture-Veterinary Medicine Library and the Music Library, small branch libraries with some 100,000 volumes. Because the methodology and analysis tools were exactly the same, precise comparisons can be made among the three locations. Whereas one library may have a higher rate of brittle materials because of environmental conditions, another library has more volumes that are shelved poorly. The common methodology assures funding agents that a uniform and reliable methodology produced credible results, and resource allocation can address the different problems.

Summary

As UT's survey team has demonstrated in branch library surveys, their methodology is adaptable. Nearly any library can apply this survey methodology, relying on staff from all over the library to help. Most staff do not have to have extensive experience in preservation. By stressing meticulous attention to detail, providing training, and using survey and analysis software, such as SPSS, large and small libraries alike can complete a collection condition survey in an efficient and effective manner.

The survey team leaders agree with Nickerson's observation about the difficulty of comparing data across institutions. Yet, Nickerson also asserts, "at the same time it is important to remember that the data being gathered are also a vital portion of the growing picture of book deterioration and preservation nationwide."[15] In order to understand more fully the larger picture of deterioration and the effectiveness of measures taken to counteract that deterioration, preservationists must be able to compare data from numerous collections of different sizes, environments, and histories. The John C. Hodges Library survey is one more piece of a worldwide puzzle.

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Appendix 1. Definitions for Collections Survey

Brittle Paper: Double Fold Test

Fold a corner of a page back and forth and back and forth again, creasing in the same place with each fold.

Paper pH

With the pH test pen, make a small mark on the lower inside margin of a page in the middle of the book. Chose a page with the same composition as most of the book; for example, if most of the pages are not coated, do not choose a coated page to test. If the paper is acidic, the mark will be yellow or clear. If the paper is acid-free, the mark will be purple.

Note Shelf

Count from the bottom shelf up and give the number of the shelf on which the book was located.

Extreme versus Mild/Moderate Damage

Pencil, Ink, and Highlighter

Extreme: The majority of the book is marked up and/or the writing interferes with the patron's ability to read the text.
Mild: A section of a few pages is underlined or there are a few scattered pages with underlining or notes and the writing does not interfere with the patron's ability to read the text.

Pages Torn or Removed

Extreme: More than ten leaves.
Mild: Less than ten leaves.

UV

Extreme: The cover is very faded and pages may be yellow.
Mild: The cover is slightly faded.

Animal Damage

Extreme: The damage is throughout the book and it must be replaced.
Mild: The damage is contained and the book can either be rebound or repaired in-house.

Food or Drink Stains

Extreme: The damage is throughout the book, and it should be replaced.
Mild: The damage is contained to a few pages or the cover.

Adhesive

Extreme: The damage is throughout the book, and it should be replaced.
Mild: The damage is contained to a few pages or the cover.

Mold

Extreme: Live mold is found in more than one small area of the book.
Mild: Mold is not live and found in only one small area of the book.

Dust

Extreme: A thick coat of dust is found on any part of the book.
Mild: A thin coat of dust is found on part of the book.

Insect

Extreme: The book must be replaced because of insect damage and/or there are still live insects in the book.
Mild: The damage is contained to a small area of the book, and the book can be rebound or repaired in house. There are no live insects still in the book.

Paper Clips, Dog-Ears, Post-It Notes, and Bookmarks

Extreme: Problem is found throughout book and has misshapened the binding, discolored pages, or caused other irreversible damage.
Mild: Problem only affects a small section of the book or there are only a few scattered through the book. Some pages may be discolored, but the problem is not significant.

Water

Extreme: The book is misshapen and cannot close properly.
Mild: The book has some pages or a cover that is stained or warped, but closes properly

Appendix 2. Condition Rankings

Excellent = no damage
Good = can be fixed or cleaned in-house in fifteen minutes or less
Poor = has to be reformatted or replaced

	Excellent	Good	Fair	Poor
Broken text block			X	
Missing covers			X	
Red-rot leather			X	
Damaged spine		X		
Loose hinges		X		
Damaged covers		X		
Missing pages (not mutilation)			X	
Damaged pages (not mutilation)		X		
Loose pages		X		
Torn endsheets			X	
Loose covers			X	
Mold				X
UV (minor)		X		
UV (major)			X	
Dust			X	
Insect				X
Water (minor)		X		
Water (major)				X
Pencil (minor)		X		
Pencil (major)			X	
Ink (minor)			X	
Ink (major)				X
Highlighter (minor)		X		
Highlighter (major)			X	
Paper clips		X	X	
Dog-ears			X	X
Post-it notes		X		
Bookmarks or other papers left in volume	X	X		
Pages torn or removed		X	X	X
Animal damage		X	X	X
Food or drink stains			X	X
Adhesive damage			X	X
Acidic			X	

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