

**Preserving the 20th Century:
California Preservation Survey of
Moving Image and Recorded Sound Collections**

March-June 2007

BACKGROUND

Current events in the 20th Century were recorded on a wide array of audiovisual media whose existence now is threatened by media deterioration and equipment obsolescence. Films of all types, from home movies to Hollywood productions, are becoming brittle, are shrinking to the point of no longer being playable, and in some cases are becoming explosively flammable. Audio and video tapes are disintegrating; the magnetic information layer is flaking off from the carrier layer underneath—information needed to recreate the sounds and images originally recorded.

And that's not all -- playback machines needed to see and hear the recordings no longer are made; most remaining audio tape decks and film projectors still in working order are heavily used and cannot be replaced. Action must be taken now to avoid irretrievable loss of the major sights and sounds that define California's heritage of the last hundred years.

But what action and on which materials? Recognizing the potential seriousness of the audiovisual media preservation problem, the California State Library initiated an investigation on behalf of libraries and archives in California with audiovisual media collections. In 2006, the State Library charged and awarded funding to the California Preservation Program, a statewide program to address issues of survival of all types of library and archives records, to undertake a multipart project to address the audiovisual problem:

- develop a preservation needs assessment survey instrument to empower libraries and archives to undertake surveys of their own collections;
- train staff from as many libraries and archives in the state as possible to assess the preservation needs of their own collections;
- conduct a statewide survey with participation of as many institutions as possible to determine the scope and scale of preservation needs of audiovisual collections;
- educate institutional decision makers to the importance of taking action and committing resources to the preservation of audiovisual materials;
- assemble data to "make the case" to potential funders, including California legislators; and

- propose a strategy for building a statewide, multi-institutional program to take action to ensure that the important sights and sounds of California's history will be seen and heard by future generations of Californians.

The project plan

Several audiovisual and preservation professionals volunteered to form an advisory committee for the project to help carry out its charge. They were:

Snowden Becker (archivist), Academy of Motion Picture Arts and Sciences
 Dan Einstein (television archivist), UCLA Film and Television Archive
 Hannah Frost (media preservation librarian), Stanford University Libraries
 Darla Gunning (librarian), 49-99 Cooperative Library System
 Jerry McBride (librarian), Archive of Recorded Sound, Stanford University Libraries and representative of the Association of Recorded Sound Collections
 Barclay Ogden (preservation administrator, Advisory Committee chair), UC Berkeley Library
 Rick Prelinger (digital archivist), Internet Archive
 David Wedeen (archivist), Chair, AMIA Preservation Committee

The Advisory Committee identified a target population of audiovisual materials to be surveyed, a methodology to use for the survey, and the target audience for the survey report.

Target population

- All moving image and recorded sound materials located in libraries, archives, and other repositories in California that offer public access to the materials, including private collections if public access is provided.
- Emphasis on masters, archival copies of works not commercially available, and materials significant to the history of California.

Methodology

- A questionnaire of preservation and access issues addressed to random samples drawn from each participating institution.
- Training program on survey implementation for staff at all participating institutions (serves an educational function and reduces data gathering costs).
- Central compilation of data across institutions to identify scope and scale of education, access, and preservation intervention needs.
- Final report that addresses actions required, costs, and design of a program to preserve historically significant recordings at risk.

Audience for report

- librarians and archivists in California
- researchers and media professionals
- funding agencies
- legislators and legislative analysts

- general public

METHODOLOGY

California's history belongs to many ethnic groups and to several distinct geographic and cultural regions, a consequence of its large size and diversity. Audiovisual materials of importance to the history of California are located in many small libraries and archives as well in several large repositories in the State. Consequently, the methodology selected for the project had to maximize opportunities for institutions to participate and to contribute information on the preservation needs of their audiovisual collections to the statewide survey.

A survey instrument specific to audiovisual materials, CALIPR, was designed for the project. Originally developed for the California State Library by UC Berkeley in the early 1990's to survey paper-based collections, CALIPR was rewritten for the Web and modified to accommodate audiovisual collections. CALIPR's design achieved several goals important to the project:

- Participation from as many institutions as possible.
- Estimates of scope and scale of preservation needs, as well as priorities for action.
- Uniformity of response so the data could be aggregated statewide.
- Increased awareness of the need to take action to preserve audiovisual materials.

CALIPR is now hosted at UC Berkeley (<http://sunsite.berkeley.edu/CALIPR/>) and is available for use by all libraries and archives at no charge.

CALIPR Survey Instrument

CALIPR is designed to enable institutions without staff preservation expertise to assess the preservation needs of their paper-based and audiovisual collections. Institutions can begin to educate themselves on issues of continuing serviceability of the collections and incorporate them in program and budget planning. For the California Preservation Survey of Moving Image and Recorded Sound Collections project, using an instrument that could be taught to staff from participating institutions also meant that data could be gathered from many more collections than otherwise would have been possible due to limitations of the project budget.

CALIPR provides instructions on how to select a random sample from the collection in order to estimate the preservation needs of the collection overall. The purpose of the random sample is to ensure that the estimates of the needs of the collection are truly reflective of its overall needs, both in scope and scale, and to avoid the possibility of surveyor bias inherent in observations based on non-random observations about collection needs.

From each of the participating institutions' collections a sample of at least 100 items was randomly drawn and examined to collect answers to sixteen questions (see the

[A/V Item Survey Form \[http://sunsite.berkeley.edu/CALIPR/itemsurvey_av.pdf\]](http://sunsite.berkeley.edu/CALIPR/itemsurvey_av.pdf)) relating to preservation concerns about the materials. These questions ranged from the environmental conditions under which the materials are stored, to their physical condition, to how much they are used, to their importance to the institution and to resource-sharing throughout the State. With this data, CALIPR was able to assign one or more of nine appropriate preservation actions to take in response to the preservation problems identified by the questions. Further, with additional information gathered on risk of damage or loss and on value, CALIPR assigned priorities for taking preservation actions.

CALIPR generates a management report to provide important insights to the needs of the collection as a whole and to those parts of the collection of greatest value and at greatest risk of damage and loss. CALIPR assesses, in general terms, what preservation needs to be done. If preservation programming already is in place, CALIPR identifies what further work needs to be done to address unmet needs. (See the [CALIPR Help Manual \[http://sunsite.berkeley.edu/CALIPR/help_manual.html\]](http://sunsite.berkeley.edu/CALIPR/help_manual.html) for more detailed information on how CALIPR works.)

CALIPR Training and Implementation

Two one-day training sessions on the application of CALIPR to audiovisual collections were offered in March 2007, one in northern California at the Berkeley Public Library and another in southern California at the University of Southern California. (See the workshop [announcement \(http://www.plsinfo.org/workshops/preserve20.htm\)](http://www.plsinfo.org/workshops/preserve20.htm) and [agenda](#).) Eighty-six staff from 70 California libraries and archives participated in the training.

In the three months following training, 32 libraries and archives completed the audiovisual survey and submitted their data for compilation with data from other libraries and archives in California. These data provide insight to the needs of audiovisual collections in a wide range of libraries and archives across the state.

Participants reported that the most difficult and time-consuming step of the survey was assigning location numbers to all locations where collection materials are stored. (This step, called "stack mapping," is needed by CALIPR to generate lists of randomly selected locations, providing a random sample.) After completing the stack mapping, navigating the CALIPR instrument, answering the questionnaire, and keying in data proved to be very easy and "intuitive" for most participants. Time expended to complete the survey varied widely among the participants, from one to several days depending on the difficulty of mapping the stacks and the size of the sample.

Some participants expressed a need for additional information to ensure administrative support adequate to complete the survey; in response, the California State Librarian provided a [letter to the directors and staff](#) of participating libraries and archives outlining benefits from the survey and urging administrative support for completion.

The data from all libraries and archives participating in the project are stored in a data base maintained on the UC Berkeley server that hosts the CALIPR software. Each participating library and archive identified a staff member to serve as data owner, who created a password to ensure the security and privacy of the institution's data. By using a project code distributed at the training sessions, the CALIPR server identified the data sets to be included in the statewide survey, aggregated the data across all institutions, and summarized the preservation needs of the aggregated audiovisual collections.

FINDINGS AND OBSERVATIONS

Thirty-two libraries and archives with audiovisual collections participated in the survey ([list of participating institutions](#)), representing more than 1,061,000 moving image and sound recordings. Their data have been aggregated to create an understanding of statewide preservation needs of audiovisual collections. While the data literally are representative only of the collections surveyed, and not of all collections in the State, the breadth of institutions that participated in the survey makes reasonable a rough extrapolation of these data on scope and scale of problems to many other California libraries and archives not included in the survey.

Composition of Survey Collections by Format (rounded to the nearest %)	
29%	Audiotape-analog
24%	Videotape-analog
13%	Disc-compact (CD)
9%	Film-non-35mm
8%	Phonodisc-LP
5%	Disc-digital (DVD)
5%	Phonodisc-Shellac
2%	Videotape-digital
1%	Audiotape-digital
1%	Cylinder
1%	Film-35mm
<1%	Belt
<1%	Disc-laser
<1%	Disc-transcription
<1%	Wire
<1%	Other

Preservation Needs Assessment Survey Questions
Summary Data (1,061,000 items total from 32 repositories)

General Information	
68% yes	Cataloged
76% yes	Working equipment available to play the item
82% yes	Staff know how to use equipment
67% yes	Access policy permits playing
73% yes	Automatic fire protection
92% yes	Protected from water
81% yes	Environmental conditions meet standards
95% yes	Shelving is adequate
88% yes	Item is shelved correctly
91% yes	Enclosure is adequate
9% yes	Item appears to be deteriorated or damaged
Curatorial Information	
39% yes	Commercially released recording
56% yes	Archival copy
57% yes	Significant historical value
62% yes	Part of a comprehensive collection
72% yes	If lost or rendered unusable, replace if possible

Interpretation of the Summary Data from the Survey Questionnaire

The summary data indicate the importance of audiovisual recordings to providing information services in California. Nearly three fourths (72%) of the recordings sampled are important enough to the institution that if damaged or lost would be replaced, if possible. More than two thirds (68%) of the items in the collections surveyed have been cataloged; more than half (57%) are considered to have historical value.

More than 60% of the items surveyed are available to the end user to play and most institutions are able to provide working playback equipment. However, 56% of the recordings also are considered to be archival copies and therefore should be used only to make service copies as needed rather than played by end users, suggesting a need for systematic replacement and reformatting of these materials to ensure that they survive.

The survey data report that most collections are maintained in reasonable environments, are protected by automatic fire protection systems, and are protected from water. These findings are consistent with environments comfortable for human occupation and for safe storage of working collections, but may not be ideal for maximizing the service lives of archival copies.

The summary data indicate that only 9% of the items in the combined samples had observable damage and deterioration. This finding is consistent with knowledge in the audiovisual preservation field that audiovisual recordings frequently show few signs of deterioration until recordings are played, at which point a fragile recording can be damaged and prove to be unplayable. The survey intentionally asked the surveyors NOT to play the recordings in order to avoid the risk of irreparable damage, thus likely under representing the number of materials in the samples that were damaged or unplayable. However, a considerable amount is known about the service lives of the media most prominently represented in the survey (analog audiotape and videotape), so that priorities for preservation actions can in part be based on the predictable service lives of the media in addition to their observable condition.

Interpretation of the Preservation Actions Recommended by CALIPR

For the purposes of a statewide preservation needs assessment, CALIPR divided the range of possible actions to correct preservation problems into nine generic actions. In order to implement the actions, two requirements must be met: 1) resources adequate to meet the needs of the number of materials in need of preservation actions, including facilities, personnel, and supplies (or funds to contract for services); and 2) information and training, both technical and management, on how to implement the needed preservation actions. With these two requirements in mind, CALIPR's recommendations for each institution have been aggregated to estimate the scope and scale of actions needed by all the participating institutions:

- to address resource needs, the NUMBER OF ITEMS in the collections requiring preservation action serves as an indicator of the scale of resources needed statewide for preservation production programs (Tables 1-2);
- to address information and training needs, the NUMBER OF INSTITUTIONS whose collections require preservation action serves as an indicator of the scale required for a preservation information and training program (Table 3).

As a reminder, the three tables that follow document only the needs of the institutions included in the Survey. The final column of each table is the percentage of the total collections or institutions surveyed in need of each action. These percentages might be taken as rough indicators of the percentages of materials in need of preservation, and institutions in need of information and training, throughout California. With the total number of recordings and the number of institutions in the State, rough, but comprehensive, planning estimates could be made of statewide needs.

Estimating Collection Needs (Tables 1 and 2)

Table 1 summarizes the total number of recordings in need of preservation actions across all of the collections assessed. With the exception of two actions in the Table, "Education" and "Disaster response plan," costs to address needs are roughly proportional to the numbers of recordings in need of each action.

Table 1: Priority for Action --all items (from collections estimated at 1,061,000 items total)		
	# items	% of total
1. Education (of staff and users)	833,000	76%
2. Replacement and reformatting	361,000	34%
3. Disaster response plan	303,000	29%
4. Inventory/cataloging	260,000	24%
5. Automatic fire protection	105,000	10%
6. Protective enclosures	88,000	8%
7. Water protection	36,000	3%
8. Environmental control	22,000	2%
9. Shelving	7,000	<1%

The costs to implement fully the preservation actions needed for the collections surveyed are large, even without the costs for other institutions in the state whose needs are not included here. Consequently, CALIPR was designed to further discriminate among collection needs. Note that Table 1 establishes priorities for action based on number of recordings across all collections needing preservation actions, without regard to risk of damage and loss, or to institutional value of the recordings. However, participating institutions did not judge all recordings to be of equal value or at equal risk of damage and loss. By incorporating value and risk information, CALIPR can assign a higher priority to preservation actions that address the needs of high value recordings at risk of damage and loss.

Table 2 is a compilation of a subset of the survey data identifying the needs of ONLY items of high value that also are at risk of damage and loss relative to other recordings in the collections. Because these numbers and percentages are smaller than the numbers and percentages for all items in the collections surveyed, limited resources can be targeted to maximize benefit for the State's most valued audiovisual recordings.

Table 2: Priorities for Action --high value and high risk items (from collections estimated at 1,061,000 items total)		
	# items	% of total
1. Education (of staff and users)	514,000	48%
2. Replacement and reformatting	239,000	23%
3. Disaster response plan	122,000	11%
4. Automatic fire protection	68,000	6%
5. Protective enclosures	31,000	3%

6. Water protection	15,000	1%
7. Environmental control	9,000	<1%
8. Shelving	<1,000	<1%

Table 1 indicates that the State's highest priority preservation actions are to institute preservation education programs for staff and users, develop preservation replacement and reformatting programs, and draft disaster preparedness and response plans for unprotected collections. These actions would benefit more recordings than any other actions. The same top priorities are seen again in Table 2, reinforcing these three priorities for action.

However, note that the scale of activity called for in Table 2 is considerably less than in Table 1. To achieve the level of activity needed in preservation replacement and reformatting in particular, it will be necessary to select carefully for preservation. Addressing the needs of the high value/high risk subset of collections first is more likely to be achievable than efforts to address the needs of all audiovisual materials.

Estimating Information and Training Needs (Table 3)

Information and training needs frequently are less related to number of materials in a collection needing a preservation action than to the number of institutions in need. Once trained, a staff member can write a disaster response plan for all the collections and teach other staff how to do basic collection care. Consequently the following table summarizes the number of institutions in need of information and training as an initial step towards estimating the costs of a statewide preservation information and training program.

Table 3: Priorities for Information and Training (based on 32 repositories)		
	# repositories	% of total
1. Education (of staff and users)	31	97
2. Replacement and reformatting	28	88
3. Protective enclosures	27	84
4. Inventory/cataloging	25	78
5. Disaster response plan	22	69
6. Shelving	14	44
7. Environmental control	13	41
8. Water protection	11	34
9. Automatic fire protection	11	34

TOWARD A STATEWIDE AUDIOVISUAL PRESERVATION PLAN

The California Preservation Survey of Moving Image and Recorded Sound Collections documents significant threats to the survival of California's heritage of audiovisual recordings. More than half of the recordings in California libraries and archives are considered to have historical significance to their communities and are intended to be archival recordings for future generations—recordings that currently are destined not to survive.

The Survey data argue for a short list of actions to constitute the core activities of a statewide audiovisual preservation program to benefit the maximum number of libraries and archives with audiovisual collections. Again, please note that the numbers below reflect the needs of the libraries and archives that participated in the Survey rather than all audiovisual repositories in California; these actions are a place to begin, and from which to expand when other California libraries and archives are able to participate.

1. Catalog, index, and make known potentially valuable audiovisual recordings that currently remain unprocessed, unknown, and therefore unlikely to be selected to be preserved as part of California's audiovisual heritage. A third of all recordings in California libraries and archives remain uncataloged; they effectively are being consigned to oblivion.

Estimated cost: 340,000 recordings @ \$35*/recording = \$ 11,900,000

(*original cataloging at a production rate of 1700 titles/year/cataloger with staffing costs of \$60,000/year/cataloger)

2. Provide staff and user education programs to reduce the inevitable, if unintentional, wear and damage to recordings from patron use. Many recordings, including archival copies, are heavily used; they are among the most valued holdings in the collections, so may not experience a reduction in demand in the near future. To the extent they must continue to be used to meet service demands, a staff and user education program can minimize wear and damage.

Estimated cost: 2 training courses/yr @ \$3,000/course = \$ 6,000/yr.

3. Establish a reformatting program to copy high value/high risk analog and digital recordings to current digital media. Recordings at risk include archival recordings that are played by users, formats already or rapidly becoming obsolescent, and media with unstable chemistry that is hastening their deterioration.

Estimated cost: 239,000 recordings @ \$150**/recording = \$ 35,850,000

(** Estimates from MediaPreserve and Vidipax: 50% analog 60 minute audio recordings @ \$100/recording, and 50% analog 90 minute video recordings @ \$ 200/recording.)

4. Establish a digital preservation program to ensure the survival of digitally reformatted moving image and sound recordings. With current technology and best practices, the digital files for the above collections would add up to approximately 5 petabytes of data (i.e., 5,000 terabytes or 5,000,000 gigabytes).

Estimated cost: 5 petabytes data @ \$3 million/petabyte/year*** = \$15,000,000/yr.

(*** Estimates from OCLC and the San Diego Supercomputer Center range from \$2-3.3 million/petabyte/year. Estimates for digital preservation services on this large scale likely will drop with future decreases in costs for storage media, system infrastructure, and labor from increased automation.)

5. Create disaster preparedness and collection salvage plans for all libraries and archives with audiovisual collections. Disaster preparedness is the most cost effective action a library or archive can take to reduce risk of loss. With staff training and a week of staff time, an effective disaster preparedness and collection salvage plan can be created to improve protection of audiovisual recordings.

Estimated cost: 2 training courses/yr @ \$3,000/course = \$6,000/yr

Implementation of a Statewide Audiovisual Preservation Plan

Two of the core preservation activities could be implemented immediately and offered as long as demand continues: staff and user education training (#2), and training in creating disaster preparedness and collection salvage plans (#5). The California Preservation Program has an infrastructure for development and management of training courses as well as for communication to California libraries and archives, so could be tapped for this purpose.

Cataloging (#1) perhaps could be a two-step process. The first step could be a curatorial and preservation review to determine whether caches of uncataloged recordings are judged to be of sufficient potential value to be worth the expense of cataloging, and whether the recordings can be played with sufficient fidelity to justify converting them to a digital format.

The second step, cataloging recordings judged to be of value and still able to be played, could involve far fewer than the current 340,000 uncataloged recordings, but nonetheless could involve costs exceeding institutional budgets. If funds for cataloging could be raised, they could be distributed to the libraries and archives holding the recordings to augment their existing cataloging capacity, thus building on skills and knowledge already in place.

The reformatting (#3) and digital preservation (#4) programs have associated costs well beyond the capacity of most libraries and archives. If new funds could be raised, these programs could be implemented efficiently as centralized statewide services responsible for setting standards, negotiating contracts with vendors of audiovisual conversion services, maintaining production schedules and quality control, and arranging for digital preservation repository services. Participating libraries and archives could select recordings for preservation and ship them to the conversion and digital preservation facilities.

The costs for a California preservation program to meet the needs of all historically significant moving image and recorded sound collections are very substantial, but the costs to get started with the most cost effective preservation program elements, and with the best known, best loved recordings of the 20th Century are within reach. Time is not on our side; either we decide to begin now or we decide to let California's audiovisual heritage disappear.

For further information on the survey instrument or data, contact Barclay Ogden, California Preservation Program, bogden@calpreservation.org.

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