The Incorporation of Digital Images into an NPS Photo Archive System

Walter Wait

One of the primary problems with NPS photograph collections is that we have so many of them. The proliferation of photographic resources has caused an information "gridlock"—no one appears to know what we have, where to look, or how to handle the ever-increasing load of images. In an attempt to address these problems, the Southwest Regional Office Division of Anthropology has created a digital image archive. Using Kodak CD technology we hope to change photographic archive liabilities into usable resource management and interpretive media assets.

The Problem With Photographs

Because of the proliferation of photographers and the National Park Service's increasing desire to collect photographic evidence, the Service has lost control over both the process and the management of the images it creates. The official photographer has generally ceased to exist. The "new" photographer appears to have neither the time nor the professional inclination to keep institutional photographic records. Because of this, there is a tremendous backlog of undocumented or poorly documented project generated images in the parks and regional offices. Undocumented photographs, negatives, and slides are images that have been either disassociated from their descriptive photologs, or have never been documented or linked to documentation.

The Undocumented Image and the "Secondary User"

Images by their very nature are difficult to describe. In many cases, the primary subject of a photograph may become secondary in importance to a researcher who values the image differently than the photographer. A researcher interested in fire management, for example, will look at a photograph of a back country archeological site with a very different perspective. Unfortunately, our hypothetical fire management researcher rarely, if ever, gets to see archeological research images. There are three reasons for this. First, a "secondary user" rarely knows of the existence of a set of images that were taken by someone in a different discipline or at a different time. There is rarely any attempt to collect copies of images or image documentation into organized finding aids that transcend the originator's specific project. Second, many newly created park and regional images remain undocumented. Third, since photographs are scattered, it is difficult for a secondary researcher to find a specific image, even when it is known to exist.

The Secondary Life of a Photograph

Once the primary use of a photograph collection is over, informal "borrowing" often occurs. The "best" photographs disappear into a publication folder, the "best" slides wind up in an interpretive slide show, a researcher borrows the images useful to a new project—and the images somehow wind up in the new project documentation. Synthetic collections are created from a variety of project generated image files. Without control, these borrowings frequently occur.

Images contain an extraordinary amount of information. That is why they are so commonly reused. Reuse, even within the life of a project, will often cloud the provenance of a set of images. The constant reshuffling, sorting, and selection of grouped photographic collections invariably lead to the loss of provenance unless careful documentation, curation, and management is maintained.

It is important to emphasize that it is difficult for the borrower to determine the rarity of a given image. Negatives may have been lost, for example, and the print may be the only surviving record of an event, place, or time. Rarity in a photograph is a relative term. For example,"rarity" might very well be a product of a specific image's level of documentation. " While it is true that almost all early photographs can be considered "rare"—images taken recently of subjects that can no longer be photographed are equally rare, and worthy of more than casual control.

The Management of Image Assets

In 1992 the Southwest Region's Division of Anthropology identified a need to create an Image Archive after analyzing the condition of cultural resource project documentation within the regional office. It was discovered that photographic resources were scattered, undocumented, and generally unavailable for secondary use. It was felt that formal, regional management of images that documented cultural and natural resource projects insured that the images would be preserved as valuable resources for the future.

The creation of a formal archive of photographic images insured that photographic images were linked to their photo-logs, were ordered and tracked as project documents, and were controlled in terms of reuse. In cooperation with the Division of Curation, the Division of Anthropology has accessioned and brought under control over 50,000 cultural resource project images in the past three years.

Ordering and accessioning these images into an image archive, however, has presented the division with a secondary problem. Once the ties to specific projects and project documentation were reestablished, the images fell into the category of "project documents." It was found that many of the images rightfully were linked with collections that were accessioned by the Division of Curation. Most collections and their associated documents are managed off-site at conservation

originals or photographically or xerographically reproducing a larger portion of the information found in the originals is spent on digitization. This digitization is despite the fact that digital data is less durable, even when printed out in many cases. For example, printouts of digital data made in the dye sublimation process are so fragile and sensitive that they are proposed for use as pollution indicators. If not cared for, the original photograph or document deteriorates and we are left with a pale digital shadow that requires continual copying, verification, and migration to new software and hardware to keep usable. During times of rapid technological change, this is an excellent recipe for losing our informational heritage.

With recent improvements in material science abounding, this is of particular concern. As with rain forests, we are only now learning how to fully extract all the value from our original source materials. Who knows what new techniques we will have in the future for analyzing and studying our documentary heritage? If we allow the originals to self-destruct while funding digitization, we may destroy or lose an important portion of our heritage without ever realizing it.

Keeping the Baby without the Bathwater

What is the solution? It is advisable for archives and museums— the impoverished custodians of the nation's heritage—to take a conservative approach to dynamic technologies, particularly in the time of cutbacks. First, we must take care of our original documents and images. The real document is not replaceable just yet by a digital copy. Maybe someday, but not now.

Second, analyze collections and begin systematically to gather standardized data necessary for describing and later distributing audiovisual and textual collections via databases and digitization. Finally, consider using outside funds to start electronic projects, so that baseline funding is not diverted from the care of collections. While awaiting funds, spend some time investigating the park's copyright and privacy situation.

Aldous Huxley called history "A branch of speculation, connected (often rather arbitrarily and uneasily) with certain facts about the past." Caring for our original archival and manuscript collections will ensure that less speculation needs to take place over the past of our sites, our parks, and the NPS.

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Diane Vogt-O'Connor is the Senior Archivist, National Park Service, Washington. She notes that she is very fond of the CD-ROM drives on her home and office computers, which she largely uses for reference purposes.

centers like the Western Archeological Conservation Center (WACC). This posed a dilemma: how to maintain an image collection for secondary uses and to reunite the images with their respective collections. It was felt that the real challenge to the photo archivist was not only to conserve the image collections and their project relationships but to create usable resources for future interpretive and comparative work.

Turning Image Collections Into Image Assets

Once a project photograph collection has been properly accessioned, managed, and conserved, the archival rules for original order have been observed, and each image is associated with its respective project and descriptive documentation, two questions remain: where to store it and how to make the image available for secondary uses.

Part of the problem with the secondary use of these ordered photographic images is the need to re-sort, compare, and assemble images in ways that were not perceived when the image was first created. A second issue is the need to ensure the protection of the original image as a vital part of a project's documentation while maximizing the ability to reuse the image for secondary purposes.

The Southwest Region has initiated a program to create digital copies of its cultural and natural resource project images in order to resolve some of the issues that have been discussed above. It is the intent of the region to use these digital copies for most secondary uses—retiring the original images to project documentation repositories under the care of the Division of Curation or the National Archives.

There were six points that influenced the decision to create a synthetic digital image archive:

- The region did not wish to maintain an extensive photographic curatorial facility.
- Capturing a copy of the original slide or negative in a digital format was found to be substantially less expensive than making an interpositive or a duplicate slide.
- The digital image was easier to store and easier to find and retrieve for secondary usage than is the original.
- The existence of the digital image copy eliminated the need for ready accessibility to the original photograph and allowed the original to be curated at whatever facility is best suited to that task.
- The use of color film had become so widespread that it could no longer be neglected as "non archival." It was showing up in most collections that require archiving. This was especially true for slide collections associated with archeological projects.
- Creating multimedia assets from the photographic originals permitted the region to make far better use of its existing image collections.

It is clear that maintaining extensive photographic collections requires professional curatorial facilities and skills. Retarding the deterioration of some films requires carefully controlled conditions. Evaluation of and restoration of poorly conserved collections is the work of specialists. The region has only limited resources with

regard to photograph storage and conservation, and the long-term preservation needs of the collections are best served by a more central repository. Creating a digital copy of the original image is the least expensive and most practical method for making image collections available for secondary use while preserving the original image for the future.

In selecting a digital format, the region wished to fill three requirements. These were:

- Digital images had to be easy to create, store, and manipulate.
- Digital images had to be cost effective.
- Digital images had to be of a high enough quality to use in place of the original for most research, planning, publication, and interpretive uses.

The region selected the Eastman Kodak "Photo CD" system to create its digital image archive.

The scanned image is compressed into an "image pack" that contains all the information needed to reconstruct an image at any one of five pixel resolutions: 3072 x 2048, 1536 x 1024, 768 x 512, 384 x 256, and 192 x 128. The PCD disk media is especially designed by Kodak with a gold reflective layer and a scratch resistant plastic outer coating. Kodak claims that these disks resist oxidation far better than the standard aluminum based CD and they claim a CD life expectancy of up to 100 years. Each Kodak Photo CD can store up to 100 image packs. The CD is generally packaged in a plastic jewel case and a dye sublimation "contact sheet" with a thumbnail print of each image is enclosed. The print also bears the reference number of each image pack and the unique number and date of the CD itself. The CD number is also engraved on the CD. Copyright information can be included on the disk.

For a more in-depth description of the Kodak Photo CD process, readers are encouraged to read "A Photographic Memory for the Digital Age," by Lori Grunin; *PC Magazine,* 2/22/94.

Photo CDs can be accessed on almost any computer platform that will read a standard CD-ROM XA drive. Almost all graphics programs available today will directly access the Photo CD format. Once brought to the computer screen, the digital file can be manipulated at will and saved to any standard graphics file structure desired (i.e., TIFF, PCX, TGA, ETC.).

To create a Photo CD, you have merely to send your undeveloped film or slides to your local photo shop for processing. Since the digital images are all self-contained on the compact disk, there is no learning curve for users or for administrators. The CD is inserted into a CD player just like an audio CD, and the appropriate numbered image is viewed on either a computer screen or television set. This ease of production, storage, and use was one of the foremost reasons the Photo CD format was chosen.

Each image costs under $0.70 cents to produce from uncut roll film or $0.90 cents from cut film or slides. In contrast, it costs over $1.30 to reproduce a slide image photographically. Copying to Photo CD is, therefore, substantially cheaper than creating duplicate slides or negatives.

The 3072 x 2048 pixel resolution of the digital copy is more than adequate for most research, professional publication, and interpretive use. The digital image can be manipulated for size, contrast, and brightness, and color value in ways which could not be accomplished with the original photographic film and traditional darkroom techniques. The image can be cropped as desired, passed over a network, pasted into a WordPerfect document, and printed on a 600 DPI laser printer. It can be printed as an 8 x 10 glossy "Dye Sublimation" print—with all the qualities of a photograph, or it can be made into a poster or other temporary interpretive display.

WINDOWS-based Kodak "SHOEBOX" software permits boolian searches of an image database and displays a thumbnail picture of the desired images. As many as 4,000 thumbnails can be placed on a single Photo CD disk. About 750 of the 640 x 480 (screen-sized) images and their associated thumbnails can be placed on a Photo Portfolio CD.

Once the image has been copied to Photo CD it becomes an "asset" for multi-media interpretive uses. Digital images can be combined with voice and interactive branching to create television based interpretive and training exhibits and displays. There is an intriguing possibility of creating interactive CD titles for production by Cooperating Associations. Interactive CD-based Images can also be mixed with text to produce full color posters for temporary displays or for use in activity announcements or site bulletins. Regional Archeologists are using Photo CD images and Eos Systems "Photomoder" software to produce three dimensional measured drawings of archeological ruins. The Photo CD Images can be compressed and transmitted anywhere in the world, and can be presented on bulletin boards for professional discussion of their content.

The original photograph, meanwhile, stays in temperature controlled darkness, safe for future generations.

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Dr. Walter Wait is the supervisory archeologist in the Division of Anthropology, Cultural Resource Center of the National Park Service, Santa Fe, NM.