Preservation Action Plan: Digital Still Image AKA Raster Images National Archives and Records Administration (NARA)

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Electronic Record or Digital Surrogate Types and Associated Formats

Digital still images are digitally encoded representation of the tonal and brightness information of a subject into a bitmap. Data from digital cameras and scanning devices record light characteristics as numerical values into a grid or raster of picture elements (pixels). The term raster data is often contrasted with vector data, in which geometrical points, lines, curves, and shapes are based upon mathematical equations, thus creating an image without specific mapping of data to pixel. Bit-depth, spatial resolution, and color encoding, for example, are all important characteristics of still images.

There are two types of raster file digital image record types: Digital still photographs of natural, real-world scenes or subjects produced by digital cameras, and scanned images of textual documents, illustrations, posters, graphics, cartographic records, photographic prints, slides, and negatives. Image file formats are standardized means of organizing and storing rasterized data that can be used on a computer display or printer.

Essential Characteristics of Digital Still Image/Raster Images

To render an authentic digital photograph one must preserve the structural, technical, and descriptive metadata that allow certain appearance characteristics to persist. Many of the characteristics native to raster image file formats are the result of industry efforts to develop common standards and interoperability. Many file formats for digital photography and scanning are the same except that most digital cameras create native camera raw proprietary formats, JPEG, and DNG, and rarely TIFF, JPEG2000, PNG, or GIF.

Appearance is a critical characteristic for this record type due to the common purpose or use of this type of record is to depict scenic information or to render the informational and artifactual aspects of a scanned original. Tone fidelity, resolution, bit depth, color encoding as well as compression algorithms all contribute to the preservation of the file. There is widespread adoption of most formats and rendering and display platforms. A unique characteristic for

scanned multi-page documents is descriptive and administrative metadata that may be held external to the electronic record and could be a risk for long term identification of the context.

Appearance

Name	Definition	Function Description
Size	Determined by bit-depth, spatial resolution, compression, and color encoding.	
Color	Color mode, color space.	Mathematical representations of color information needed to encode and decode color information such as Hue, Chroma, lightness, white point.
Bit-depth	The number of bits used to indicate color and tone information of a pixel.	High or low bit depth contributes to the pleasing transformation of color accuracy, gradients, and tonal information. Also greatly affects issues such as signal clipping and transformative image editing.
Orientation	Portrait versus Landscape.	

Structure

Name	Definition	Function Description
Layout Structure	Embedded technical metadata captured at the time of creation describing, among other things: File format/encoding; Compression; Resolution; Bit depth; and EXIF (Exchangeable Image File Format) information.	

Behavior

Name	Definition	Function Description
Display	Image	The only essential behavior for a digital photograph is the ability to visually render it. Other functionality, such as photo enhancement or manipulation, may be available in the user's native software environment but is not inherent to the record.

Context

Name	Definition	Function Description
Technical Metadata	This includes but is not limited to: Originator: Unique identification number assigned at creation; origination date; coding history; levels; camera type.	Most standard (See acceptable and preferred below) Digital Still images Files conform to the technical metadata elements described in ANSI/NISO Z39.87 and could contain or link to: data on the digitizing process including file structural specifics, sample rate and bit depth, and other elements used by rendering software and hardware.
Descriptive Metadata	This includes but is not limited to: Unique photograph identification number; Caption/Title; creator/Photographer; Copyright.	Digital still images could contain, or link to, metadata that describe any attribute that could be displayed in a photograph, such as those described in Dublin Core or International Press Telecommunications Council (IPTC) standards.

Current NARA Transfer Guidance for Digital Still Image/Raster Images
Bulletin 2014-04

- Preferred:
    - Tagged Image File Format (TIFF)

- Acceptable:
    - JPEG File Interchange Format (JFIF) with Joint Photographic Experts Group (JPEG) compression
    - Digital Negative (DNG)
    - Portable Network Graphics (PNG)
    - JPEG2000 (JP2)

Current NARA Format(s) for Public Access and Reference for Digital Still Images/Raster Images

Formats for Public Access are those made available online through the National Archives Catalog. Formats for Reference are defined as those made available to researchers upon direct requests for digital copies.

Formats Available for Public Access: Content created or delivered for public access in the Catalog is delivered primarily in the following file formats: PDF (Textual and Image), JPEG (Textual and Image), MP3 (Audio), and MP4 (Audio/Video) and ASCII (Datasets). Other file formats may be present depending on when they were added to the Catalog.

Format(s) Available for Reference: JPEG