Module 1: Imaging objects (Fluid-preserved)

Module 1A: Record images of ledger/card or catalog/field notes (materials not stored with specimens)

Task ID	Task Name	Explanations and Comments	Resources
T1	Select and retrieve card, ledger, field notebook, or other ancillary document to digitize.	This workflows deals specifically with imaging cards and individual pages of ledgers and field books, whether bound or cut. Ledgers and field notebooks might reference identifiable specimens, collecting events, or collecting localities.	• Technician. • Institutionally specific digitization plan, guidelines, or protocols.
T2	Transport selected materials to staging area or directly to imaging or scanning station.	A staging area might be used to organize materials, cut bindings (in institutions where this is practiced), and stack materials for scanning. Transporting material to the staging area or imaging station can be independent of imaging progress and can occur in assembly-line fashion. Material moved to the staging or imaging station may exceed the quantity of material possible to image in a single session, in effect creating a backlog that encourages continuous use of imaging/scanning equipment and eliminating potential down time while awaiting the next set of material to be delivered.	• Technician. • Cart or transport vehicle. • Staging area.

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		Some institutions rely on mobile imaging stations that can be moved to the objects to be imaged, eliminating the need to transport materials to an imaging station.	
T3	Isolate card or page(s) to scan or image.	This task depends on institutional protocol and may include determining where to begin based on the stopping point for the previous day's or session's activity. Some institutions cut the binding on field notebooks or ledgers to facilitate more efficient scanning, which may trigger re-binding once these documents are digitized. Some institutions leverage equipment from other institutional resources, such as page turning equipment or book page imagers from the information or library sciences. Institutions are encouraged to seek out such resources and forge collaborations.	• Technician. • Institutionally specific digitization plan. • Intra-institutional partnership agreements.

T4	Record image of page, card, or document.	Specific protocols vary and usually depend on the type and brand of imaging equipment used. Some institutions record entire ledger pages for subsequent linking to individual database records that represent one or more of the specimens or collection objects included within the image. Immediate (often temporary) storage of captured images is usually provided by direct download from camera to computer as part of the image capture software workflow. This allows for an immediate quality control check and is the preferred method of temporary storage. Some institutions capture images to an internal camera card and transfer the captured files at a later time. This second method adds a time-consuming step to the process and prevents immediate quality control by the imaging technician. Imaging technology decisions might depend on whether materials are bound or unbound, and whether they can or should be fed into a	• Technician. • Scanner or digital SLR. • Equipment and institutionally specific protocols with precise, illustrated, step-by-step instructions. Representative equipment currently in use includes: • Canon Mark 5D or related camera, • Nikon D800, D3X, or related camera, • Kirtas APT BookScan book page scanner, • Flatbed scanners. Representative image capture software include: • Canon Digital Photo Processional and EOS Utility, • Nikon Camera Control Pro, Nikon Capture, Nikon View

		document feeder attached to a scanner. Unbound material of regular shape and not subject to damage due to fragility can be efficiently processed by scanner through a document feeder. Bound or fragile material, cards/pages of irregular shape, large documents, documents that should be kept intact (e.g. ledgers) may be better recorded by camera.	Technical details to consider when acquiring imaging equipment include: ● automatic naming of image files, ● whole-page imaging capability, ● direct file storage from imaging device, ● image file types supported (e.g. TIF, JPG, RAW, etc.), ● availability of scanner document feeders.
T5	QC images	Check images for: ● sharp focus, ● clarity, ● completeness, ● clear view of entire page, ● orientation. Quality control at this stage is often an iterative task during which poor quality images are identified and immediately and repeatedly re-imaged until a satisfactory image is obtained.	Quality control technician.

T6	Populate core metadata (to include process, administrative, and technical details).	Metadata might include: ● EXIF, ● IPTC, ● personnel details, ● collection details, ● date/time, ● copyright. Utilization of metadata pre-sets, as available within Adobe Lightroom, increases efficiency and allows batch processing of images. Metadata should never be stripped from archival, raw, or in-house images. This step may occur in other phases of the workflow. Taxonomic or other data than can change through time are not suitable to include in metadata.	● Technician. ● Adobe Lightroom. ● Adobe PhotoShop. ● Camera manufacturer software (Digital Photo Pro; Capture NX2, etc.)
T7	Assign filename	Strategies differ. Digital cameras can often be configured to assign names automatically to a standard or	● Technician. ● Institutionally specific policies and protocols for governing standard file-naming strategies.

		customized format. Many institutions use barcode value, catalog number, field number, date recorded, or some combination of these within the file name, depending on whether the objects are collection-object or collecting-event related. In general, simple file names are preferred. Procedures should ensure that file names are unique.	See https://www.idigbio.org/content/idigbio-image-file-format-requirements-and-recommendations
		It is generally best not to include taxonomic or other non-persistent data in a filename. Doing so creates the need for continuous re-visits and edits of file names as taxonomy evolves, an activity better handled via a database.	
		In some instances, filenames are immediately recorded in a database that links newly created or existing collection object or collecting event records to the image. Or, images are linked to corresponding database records via automated processes during other modules. Consistent and clearly stated file naming policies are important to support this linking process at whatever stage it occurs.	

		Optional Optical Character Recognition (OCR) of images for the purpose of extracting barcode or other identifier values may be used as part of a file renaming strategy.	
T8	Process image.	Image processing involves non-destructive editing to archival files. For cards, catalogs, ledger, and other non-specimen images, adjustment to improve clarity and readability are desired.	
T8	Store file.	File storage is generally divided into several categories: ● Archival, ● High resolution for web presentation, ● Thumbnail.	● Hardware. ● Software. ● Digital Asset Management System (DAMS).
T10	Return object to storage container.	In some instances, this may require re-assembling ledger books that have been cut for imaging. Re-assembling is probably best accomplished via a separate workflow. Ensuring that catalogs, cards, etc. are re-filed in the original order to ensure re-finding them is an important consideration.	● Technician. ● Cart or transport vehicle.

T11	Archive image.	The succeeding workflow module for many institutions involves creating database records and linking/attaching images to them, or linking/attaching existing database records to card, catalog, or ledger images. Processes in anticipation of transitioning to this activity are important.	• Technician. • Hardware.