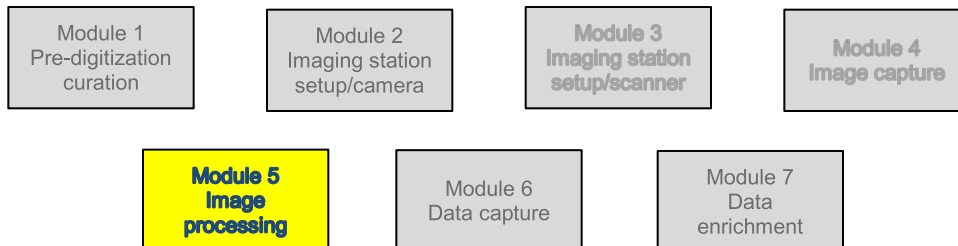


Workflow Detail: Image Processing (flat sheets and packets)



Module 5: Imaging Processing Task List (Revised 2012-11-07)

Task ID	Task Description	Explanations and Comments	Resource(s)
T1	Quality control/assurance.	<p>Spot check images within image browser for imperfections in exposure, focus, etc., and re-route to Module 4, as necessary.</p> <p>Check for missing images as evidenced by barcode or filename sequence, or other parameters.</p>	Image browser or editing software, e.g. Adobe Lightroom, Adobe Bridge, Apple Aperture, Canon Digital Professional, Nikon Capture NX2.
T2	Add metadata to EXIF and IPTC in batch (including copyright information and photographer).	<p>The Exchangeable Image File Format (EXIF) data in the header produced by most DSLR cameras contains useful information, including but not limited to image date/time, camera manufacturer and model, ISO rating, image size, resolution, exposure details, lens type, and a field for comments. These data remain with the image as it is copied from one storage device to another and are important properties of the image.</p> <p>Alteration or application of additional EXIF or other image metadata should be accomplished via a batch process, such as that provided through Adobe Lightroom, most camera control software, or a custom-designed application.</p> <p>EXIF data should never be stripped from RAW or archive files or any of the derivatives that remain with the institution.</p>	Image processing software.



		<p>Copyright and rights usage terms should be added to IPTC (International Press Telecommunications Council) fields.</p> <p>It is recommended that the name of the imager be inserted into the EXIF for tracking, recognition, and to assist in training and quality assurance.</p> <p>Data not included within the camera-produced EXIF, such as imager name or those suggested by Audubon Core, may be inserted into the EXIF Comment field, either as string data or as XML.</p> <p>This task could also be accomplished as part of Module 4.</p> <p>See Morris' chapter on metadata standards in GBIF's digital imaging best practices manual at: http://www.gbif.org/orc/?doc_id=2429</p>	
T3	Process multiple images	<p>Some institutions produce more than one image (stacking) of a single specimen then merge these images into a single image file. An example of this is when the contents of a fragment packet is recorded in one exposure and the label on the outside of the same fragment packet is recorded in a second one.</p>	
T4	Adjust white balance and/or light levels.	<p>Image adjustments are controversial. Some institutions recommend that no post-processing be effected on scientific specimen images. At a minimum, it is recommended that color balance, saturation, sharpening, and similar adjustments be avoided or applied only with the goal of creating faithful reproductions of original content and only as parametric edits saved as metadata with RAW files. See http://dpbestflow.org/image-editing/parametric-image-editing.</p> <p>Post-image processing that adjusts white balance or applies auto-levels is performed by some institutions, but should be accomplished only when images include a color standard with white and black swatches.</p> <p>Post-processing of archive TIFF files is not recommended.</p>	Image processing software.



		See Morris' chapter on color management in GBIF's digital imaging best practices manual at: http://www.gbif.org/orc/?doc_id=2429	
T5	Create derivatives and archive image files.	<p>Subtasks involved here include:</p> <ul style="list-style-type: none"> • Converting proprietary camera RAW formats (e.g. NEF, CR2, PEF, etc.) to DNG or TIFF format, • Creating JPG files from camera RAW, DNG, or TIFF, • Distributing JPG files to an image server, • Archiving DNG or unedited TIFF files in a permanent, redundant storage repository. <p>TIFF files produced by flatbed scanners and other devices for which TIFF is the native format should be archived without editing.</p> <p>Some institutions also create a set of TIFF files as master, unedited files from which future on-demand derivatives can be produced.</p> <p>For RAW files, parametric edits are sometimes saved in sidecar files or an image database. See http://dpbestflow.org/image-editing/parametric-image-editing</p> <p>For detailed image processing recommendations, see iDigBio's Image File Format Requirements and Recommendations (https://www.idigbio.org/sites/default/files/sites/default/files/Image_File_Format_Recommendations_and_Standards.pdf).</p> <p>See Crick's chapter on file management in GBIF's digital imaging best practices manual at: http://www.gbif.org/orc/?doc_id=2429</p>	Image processing software.
T6	Submit final JPG files for Optical Character Recognition (OCR).	Some institutions perform OCR on image files as part of post-processing, in preparation for inclusion in the data capture and/or OCR/NLP modules.	OCR software application/ protocol/ workflow.





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