Herbarium Specimen Digitization:
Image processing with Adobe Photoshop Lightroom

Kimberly Watson & Michael Bevans
11 December 2013
Mobilizing Small Herbaria for Digitization Workshop

The New York Botanical Garden
NYBG Imaging Workflow

1. **Retrieve Specimens from Herbarium**
2. **Photograph Specimens**
   - Scan Barcode to Name Files
3. **Re-file Specimens in Herbarium**
4. **Transfer**
   - .CR2 to External HD
5. **Image Quality Control**
   - Adobe Lightroom
6. **Export Derivatives**
   - .DNG, .JPG
7. **KE Emu Database**
   - Full Size, RGB JPEGs
8. **Batch OCR**
   - Cropped, Grayscale JPEGs
9. **Archive**
   - DNG
10. **Data + Jpegs**
    - Available Online
Image Quality Control

Browse and examine images for:

- Focus
- Exposure (target values)
- Color balance
- Content
  - All relevant aspects of specimen are visible
  - All labels are visible
  - Color checker and scale bar present
  - Specimens rotated right-side-up
  - Barcode matches file name
Post Capture Processing

- QC file names, focus
- Input Metadata
  - Creator
  - Copyright
- Image processing
  - Exposure
  - Contrast
  - Color Balance
  - Sharpen
  - Remove Chromatic Aberration
Export Derivatives

Convert RAW file to DNG for archive
  • Open license raw image format
  • Preserves metadata in the file
    – XML data in header
    – No sidecar file
  • Small file size
  • Full bit depth

Export JPEG for access (web, print)
  • Full resolution
  • sRGB color space
Overview

- Image import process
- Create and apply metadata preset
- Quality Control: file name and focus
- Image processing
- Create User Preset
- Image export process
Adobe Photoshop Lightroom

- Cataloging and image editing software
- Edits are NOT made directly to an image (unlike Photoshop)
- Edits saved as a set of instructions in a catalog file (.lrcat)
- Edits applied when images are exported from Lightroom

Version 2.7 shown. Other versions may vary in appearance.
Library Module

Import Images
Import Images

Navigate to and select images to import.
Metadata Preset

Make a preset of metadata to be embedded in every image: copyright, creator. Apply preset to batches of images during import.
Metadata Preset

Name preset. Enter data in relevant fields. Select those fields. Create.
Metadata

Can also add/edit metadata after import. Keywords, title, caption, etc. Can synchronize metadata for 1 image with any other selected images.
File Name & Image QC

In Loupe view, confirm image file name matches barcode. Edit, if needed. Confirm labels and specimens are in focus. Check every 10-15 images.
Batches for Processing

In Grid view, filter metadata and group images by date, shutter speed, and aperture. Select brightest image.
Develop Module

Image editing steps include: adjusting white balance, exposure, tone curve, sharpening, lens correction.
White Balance

Zoom-in on color checker. Select white balance eye dropper. Move it to a neutral gray square and click.
Tone Curve: Linear

Scroll down to Tone Curve. Select Point Curve: Linear.
Exposure

Select Exposure. Move cursor to center of white target square. Read histogram. If color target is along perimeter of lightbox, RGB values of 93% preferable for white, otherwise 96%.*
Adjust Tone Curve

Select Tonal Adjustment Tool. Position it over the light grey reference square, click and drag the cursor down until the value is 63%.* (X-Rite ColorChecker Mini)
Adjust Tone Curve

Repeat process for medium grey and black squares, until values are 48% and 20% respectively.* Press Done. Then change Point Curve: Medium.
Sharpening

Sharpen to taste. Over sharpening causes visible artifacts.

Conservative Adjustment: Amount = 50, Radius = 1.0, Detail = 33
Remove Chromatic Aberration

Newer versions of Lightroom have a box to check. Older versions use sliders to minimize color fringing.
Apply Edits to Batch

With the edited image selected, select all thumbnails (Ctrl+A).

Press Sync…
Apply Edits to Batch

Check boxes corresponding to edits made and to be applied to all. Press Synchronize.
Develop User Preset

Make a preset of edits to apply to every batch: sharpening, linear tone curve, remove chromatic aberration. Apply preset when importing images.
Image Export

Select folder/images for export. Check number of images selected. Export.
Export DNG for Archive

Choose destination folder. Option to modify file name. Select Format: DNG. Export.
Export JPEG for Access

Choose destination folder. Select Format: JPEG
Color Space: sRGB  Quality: 100
Image Metadata

Metadata embedded in image wherever it goes.
View image properties, or open file with software like Photoshop, Lightroom.
For more information...

- Tri-Trophic TCN, Project Documents: http://tcn.amnh.org/documents
- Blog by Michael Bevans, former Information Manager for Digitization at NYBG: http://digitalphotorepro.blogspot.com
- B&H Event Space: http://www.youtube.com/bandh
- Adobe Photoshop Lightroom: http://www.youtube.com/user/AdobeLightroom
Thank you