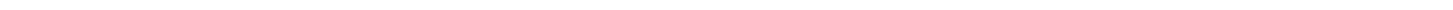# USGS-NPS Vegetation Mapping Program
Final Project Product Guidelines, for Online Presentation and Retrieval

January 2009

PARK PROJECT CHECKLIST FOR FINAL PRODUCTS

The following data files must be included in a final vegetation map data set.

- o **Technical Report**

- o **Plots Database**

- o **Plots and AA Field Photos**

- o **Digital Aerial Photo Data, Flight Index, Graphic & Metadata**

- o **Vegetation Plots (point data) Spatial Data, Graphic & Metadata**

- o **Vegetation Map (polygon data) Spatial Data & Metadata**

- o **Park Boundary Spatial Data & Metadata**

- o **Thematic Accuracy Assessment Points Spatial Data, Graphic & Metadata**

- o **Accuracy Assessment Contingency Table**

- o **Final Vegetation Map Graphic using NPS Map Standards**

INTRODUCTION

The attached guidelines are designed to standardize and thus facilitate the rapid turn-around of Vegetation Inventory Program (VIP) final products and get them online as quickly and efficiently as possible.

They reflect the USGS-NPS decade-long experience on best practices of how to group and parse the VIP digital products for the current online environment maintained at the USGS Center for Biological Informatics in Denver, CO.

While it is recognized that there will always be exceptions that will have to be dealt with on a case by case basis, the USGS-NPS management team has discovered that adherence to this model of data organization and formatting of final products accelerates the turn-around for project data web posting and as such, makes the data available to NPS staff, natural resource scientists, federal agencies and the public in a timely manner.

We understand the degree of effort that is required to generate a high-quality, standardized vegetation map under the USGS-NPS Vegetation Inventory Program. We recommend you allow sufficient time and effort to produce final products adhering to the specified formats in this document for consistency and rapid availability of the data.

To develop final reports for vegetation mapping projects, investigators should consult with project key officials and follow the appropriate NPS guidelines. The final report will address vegetation classification and description, vegetation mapping, and accuracy assessment. It will include a full description of project methods, results and a summary discussion. If the report will be published within the NPS NRTR series or another technical report series, additional standards and guidelines may be applicable.

After the report, maps, databases, and other digital products have been reviewed and accepted as final by the project key official, they will be reviewed by the USGS/NPS National Vegetation Inventory Program (NVIP) and placed on the website. In order to facilitate this effort, please follow the file format and naming convention guidelines provided below. Many projects were initiated prior to the issuance of these guidelines by NVIP. In those cases, investigators should consult with park, network, and/or NVIP staff to determine how best to meet the new guidelines.

Any questions, or request for clarification should be addressed to Ms Theresa Singh, VIP data content manager (tsingh@usgs.gov) at USGS CBI.

PARK PROJECT OUTLINE FOR FINAL PRODUCTS

I. Aerial Photography
- a. Orthophoto Mosaic Graphic
- b. Spatial Orthophoto Data (.exe)
- c. Flight Line Index

II. Vegetation Information - {one link}
- a. Vegetation Report, containing the following items:
  - Photo Interpretation Key
  - Vegetation Descriptions
  - Vegetation Key
  - Photos of Map Classes
  - Accuracy Assessment Methods and Results

III. Field Data
- a. Field Plots Points Graphic
- b. Spatial Field Plots Data (.exe)
- c. Plots Database (MDB)
- d. MS Excel format of Physical Descriptive Data for Plots
- e. MS Excel format of Species List Data for Plots
- f. Field Photos collected during PLOTS and AA (.zip or .exe)

IV. Geospatial Vegetation Information
- a. Vegetation Graphic
- b. Spatial Veg Data (.exe)
- c. Spatial Boundary Data (.exe)

V. Accuracy Assessment Information
- a. AA Points Graphic
- b. Spatial AA Data (.exe)
- c. MS Excel Contingency Table

VI. Project Metadata
- a. Aerial Orthophoto
- b. Field Plots
- c. Spatial Veg Data
- d. Boundary
- e. Accuracy Assessment
- f. Others - as appropriate

VII. Other Helpful Information for File Creation

VIII. File Naming Standards

I. **Aerial Photography**
   a. Graphic File: The pdf file name is the *parkname* and the type of geospatial data being shown, such as Orthophoto. Example: grteortho.pdf. Example: http://biology.usgs.gov/npsveg/grte/images/grteortho.pdf
   b. Spatial Data (.exe): This is a digital file of the land cover (aerial) imagery data used in this project. All geospatial data must be in UTM NAD 83. In most cases this is a CIR mosaic or an orthophoto. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/grte/grteortho.exe.
   c. Aerial Photo Flightline Index – photos.pdf. A PDF file of a flightline index linking the flightline numbers to the aerial photos and listing the aerial photos by numbers. Not all of the aerial photos are shown, just every other one on each flightline. Example: http://biology.usgs.gov/npsveg/zion/photos.pdf.
   d. Graphic File: This is a PDF file for each aerial photograph, using a unique photo number on each photo. Example: 2-3.pdf, 6-11.pdf, 18-20.pdf, and 23-36.pdf. Examples: http://biology.usgs.gov/npsveg/zion/aerials/2-3.pdf, http://biology.usgs.gov/npsveg/zion/aerials/6-11.pdf, http://biology.usgs.gov/npsveg/acad/aerials/18-20.pdf and http://biology.usgs.gov/npsveg/acad/aerials/23-36.pdf.

II. **Vegetation Information**
   a. Vegetation Report – <u>ONE REPORT:</u> Create a PDF full report (*parkname*rpt.pdf).
      ▪ Example: http://biology.usgs.gov/npsveg/zion/zionrpt.pdf.
      ▪ Report MUST contain: Vegetation Description, Vegetation Key, Map Class Descriptions, Photos of Map Classes, Photo-interpretation Key, Accuracy Assessment Methods and Results.

III. **Field Data**
   a. Graphic File**:** The pdf file name is the *parkname* and the type of geospatial data being shown, such as Plot locations. Example: zionplots.pdf. Example: http://biology.usgs.gov/npsveg/zion/images/zionplots.pdf.
   b. Spatial PLOTS Data: The executable files should contain the geospatial shapefile of the PLOTS data. All data must be in UTM NAD83. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/zionplot.exe.
   c. Microsoft Access PLOTS Database: Field Data for Plots, Accuracy Assessment, Physical Descriptive and Species Listing Data - *parkname*data.mdb. This is a Microsoft Access Database of the park field data, such as accuracy assessment, accuracy assessment species, observation points, plots, plot-species, geology classes, locations, jurisdictions and any other park field data. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/ziondata.mdb.
   d. Physical Descriptive Data for Plots - The plots file is extracted from the *parkname*data.mdb database. The file name is plots.xls. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/plots.xls.
   e. Species Listing Data for Plots - The sp_cov file is extracted from the *parkname*data.mdb database. The file name is sp_cov.xls. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/sp_cov.xls.
   f. Field Photographs collected during PLOTS and AA: Contained within the PLOTS database are references to field photos collected as part of the project. We would like a .zip or .exe file called "field_photos". The files within the .zip or .exe usually contain jpeg, gif, or pdf format. Please do not exceed 2GB on each file. If so than create more than one .zip or .exe file and call it field_photos1.zip or .exe, field_photos2.zip or.exe and etc.

IV. **Geospatial Vegetation Information**
   a. Final Map Graphics: Map layouts need to follow NPS standards. For NPS standard map templates, see: http://imgis.nps.gov/templates.html. These are graphic files (.pdf). The pdf file name is the *parkname*. We would like a low resolution for viewing and a high resolution PDF

for reprinting maps. Examples: http://biology.usgs.gov/npsveg/zion/images/zionveg.pdf, http://biology.usgs.gov/npsveg/zion/images/zionmap_large.pdf.

    b. Spatial Vegetation Data: The executable files should contain the following: The shapefile or geodatabase of the vegetation polygon and associated attribute data. All data must be in UTM NAD83.

        Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/zion.exe.

    c. Spatial Boundary Data (.exe) - Shapefile of the park boundary used for this project: Example:

        http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/zionbdy.exe.

V. Accuracy Assessment (AA) Information

    a. Graphic files (.pdf). The pdf file name is the *parkname*aa. Example: zionaa.pdf, http://biology.usgs.gov/npsveg/zion/images/zionaa.pdf.

    b. Spatial AA Data: The executable file which contains the shapefile or geodatabase of the Accuracy Assessment geospatial data. All data must be in NAD83. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/zionaa.exe.

    c. Accuracy Assessment Contingency Table – This accuracy assessment matrix (aa_matrix.xls) should include the code description below the matrix. Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/aa_matrix.xls.

VI. Project Metadata

    a. Aerial PhotoMosaic Metadata – meta*parkname*ortho.txt. Metadata for aerial orthophoto mosaic (Text format only). Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/grte/metagrteortho.txt.

    b. Field Plots Metadata – meta*parkname*field.txt – Metadata for the Plots Microsoft Access Database (Text format only). Example: http://biology.usgs.gov/npsveg/zion/metazionfield.html.

    c. Geospatial Metadata - meta*parkname*spatial.txt – Metadata for Geospatial Vegetation Information (Text format only). Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/metazionspatial.txt.

    d. Park Boundary Metadata - meta*parkname*bdy.txt – Metadata for Park Boundary (Text format only). Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/metazionbdy.txt.

    e. AA Metadata - meta*parkname*aa.txt – Metadata for Accuracy Assessment Information (Text format only). Example: http://biology.usgs.gov/npsveg/ftp/vegmapping/zion/metazionaa.txt.

    f. Other metadata, as appropriate

VII. Other Helpful Information for File Creation

    a. **Instructions for PDF Conversion of Vegetation Mapping Reports: (Instructions refer to MS Word 2002 / Acrobat 7.0 / Reader 9.0)**

    Hint: PDF conversion is much easier if the Word document you are trying to convert is as small as possible. Most graphics are unnecessarily large. To reduce them, left click on them, cut, then choose "Picture (JPEG)" from the "Paste Special" dropdown under the Edit menu. The graphic/photo should go from having little dark handles to having green or white circles for handles. Sometimes all you get is a black square, in which case you have to trick Word by choosing something else from the Paste Special menu until you get a format that will, when pasted as a JPEG, look like your original graphic/photo. Depending on the number of photographs and graphics in your document, you can reduce the size by an order of magnitude.

    1. You can do the conversions while waiting for the NRTR and TIC numbers, because requested edits are usually minor.

    2. In creating the *parkname*rpt.pdf file, you will generally have to break it into chunks no bigger than 40-50MB in order for the machine not to hang up while converting/tagging. I often do the entire report through Appendix F as one chunk, then appendix G-H (field key) as another chunk, then Appendix J (map class guide) by itself.
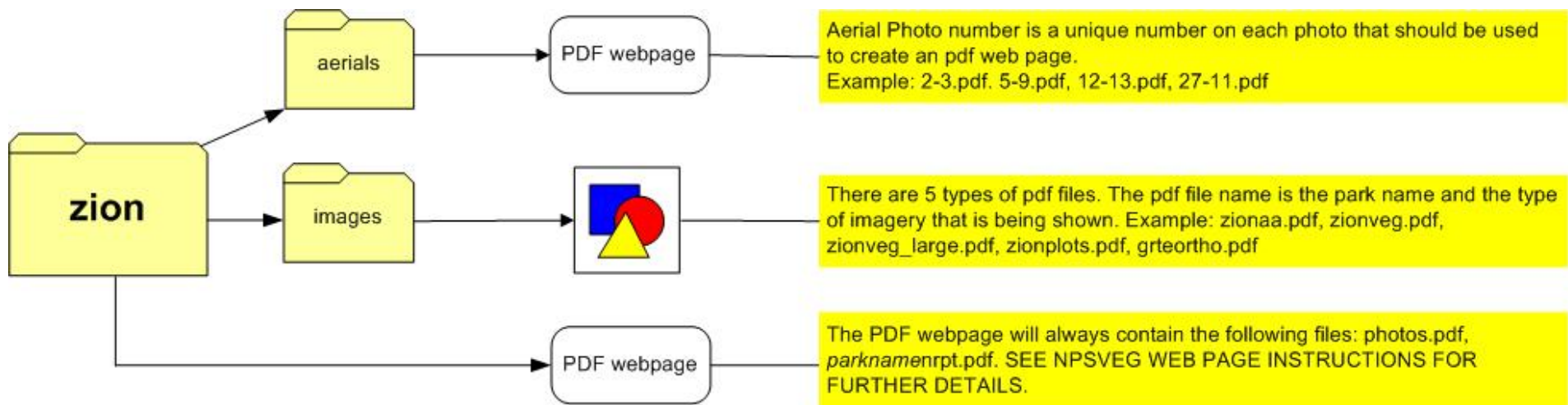
3. Creating the tagged document takes quite a while (at least 10 minutes per chunk) and it is not a good idea to be doing anything else on the computer while the conversion is going on.
    a. When all the chunks have been converted successfully, run through each chunk and make sure there are no gross errors like extra or missing pages, or errors in formatting or page breaks, or strange colors invading the figures.
    b. Once all these have been fixed, either in Word and reconverting, or in Acrobat, rejoin the chunks using the "Insert Pages" command under the Document menu.
    c. Once you have a single document, check through the entire thing and make sure there are no missing or extra or blank pages, the formatting looks good, etc.
    d. Rebuild the TOC at the front of the document to repair the reference errors created when you broke it into chunks.
    e. Go through the document page by page with the TouchUp Toolbar open (Tools -> Advanced Editing -> Show TouchUp Toolbar)
    f. Activate the TouchUp Reading Order button and on the menu that opens, make sure all of the options are checked. Each page will then appear as a series of numbered, Xed or grayed-out boxes.
    g. On each page, make sure of the following:
        i. All text, including titles, figure captions and table headings, is in gray text boxes
        ii. Figures are in figure boxes
        iii. Tables are in Table boxes
        iv. The numbers in the boxes make sense as to their reading order
    h. If not, and especially if the formatting is a mess with extraneous structures and numbered boxes, use the "Clear Page Structure" button on the Reading Order TouchUp menu to start over.
    i. Activate the TouchUp Reading Order tool, highlight the text or table or figure (all of it, trying not to overlap adjacent structures much or at all) and select "Text" or "Table" or "Figure" buttons as appropriate from the Reading Order TouchUp menu. Don't bother with any of the other choices. They just complicate things.
    j. You can fix the order of things by clicking on the "Show Order Panel" button on the Reading Order TouchUp menu, scrolling to the right page number, and using your mouse to drag the various elements around (grab the little colored boxes on the left; the text doesn't drag!)
    k. Tables and Text boxes do not need tags. Figures (photos and graphics) do. To create tags for these:
        i. Select the TouchUp Object Tool from the TouchUp Toolbar.
        ii. Right click in the figure you want to tag.
        iii. Select "Properties" from the bottom of the menu
        iv. Select the "Tag" Tab from the properties menu and enter your tag text in the "Alternate Text" box.
        v. Select "English US" from the Language dropdown menu below the Alternate Text box.
        vi. Use these standards for tagging figures:
            1. For scenic photos, enter a 1 to 4-word description of what the photo illustrates: "Yampa River Canyon"
            2. For graphics, enter "Figure XX map" or "Figure XX graphic" or "Figure XX chart" – as appropriate
            3. For photographs with captions, enter "Figure XX photo"
            4. For photographs without captions, as in the appendices, enter a descriptor, like "Acer negundo Woodland photo" or "Riparian Shrubland Complex aerial photo example"
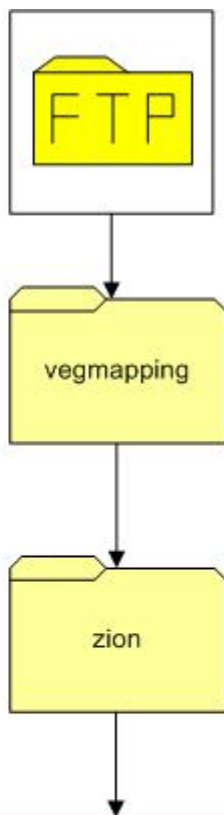
5. If there are several photos for a figure, enter the text as recommended above, then a number that reflects the reading order number: "Bromus tectorum Herbaceous Vegetation photo 1"

4. When all of this is done and you have checked back through the document to make sure nothing was forgotten, *then* fix the bookmarks and links as stipulated in the guidelines and finally, run the accessibility check.

5. Finally, for both PDF reports, while the document is open, click on the "Reduce File Size" option under the File menu. You'll be amazed at how much your document shrinks.

b. **GENERATING .EXE FILES**
   - Depending on the WinZip version:
     o For the Full Advance Version: Create the zip file than under file name Actions, scroll down to Make .EXE File and click on it to create an .EXE file.
     o For a Limited Version: Create the zip file, close the zip file and go to file of where it located and right click on the file and scroll down to WinZip and than scroll down to Create Self-Extractor (.EXE) and click on it to create an .EXE file.
     o If unable to do either one of these process as described above than create a ZIP file only.

c. **DELIVERING A GEODATABASE -VERSUS -SHAPEFILES**
   - The Vegetation Inventory Program would prefer that all spatial data (e.g. PLOTS point data, AA point data, Vegetation polygons, photographs) are delivered in one GEODATABASE with the appropriate relationships retained.
   - For a good example of a geodatabase, please download and review the Northern Colorado Plateau Network's geodatabase structure in Natural Bridges NM. Example: http://biology.usgs.gov/npsveg/nabr/index.html
   - Personal Geodatabases or File Geodatabases are recommended.
   - Only one Geodatabases is needed, containing all the spatial data.

VIII: FILE NAMING STANDARDS:
- NO capital letters used in naming each file.
- The following is a list of standard naming conventions:
  - Aerial Photography
    o *parkname*ortho.pdf
    o *parkname*ortho.exe
    o photos.pdf
    o 1-02.pdf or 11-13.pdf or 4-5.pdf depending on the unique photo number.
  - Vegetation Information
    o *parkname*rpt.pdf
    o class_matrix.xls (OPTIONAL)
  - Field Data
    o *parkname*plots.pdf
    o *parkname*plot.exe
    o *parkname*data.mdb
    o plots.xls
    o sp_cov.xls
    o field_photos.exe or .zip – containing photos referenced in the PLOTS DB.
  - Geospatial Vegetation Information
    o *parkname*veg.pdf
    o *parkname*veg_large.pdf
    o *parkname*.exe
    o *parkname*bdy.exe
  - Accuracy Assessment Information
    o *parkname*aa.pdf

- o *parkname*aa.exe
- o aa_matrix.xls
- Project Metadata
  - o meta*parkname*ortho.txt
  - o meta*parkname*field.txt
  - o meta*parkname*spatial.txt
  - o meta*parkname*bdy.txt
  - o meta*parkname*aa.txt

zion
- **aerials** → PDF webpage
  - Aerial Photo number is a unique number on each photo that should be used to create an pdf web page.
  - Example: 2-3.pdf. 5-9.pdf, 12-13.pdf, 27-11.pdf
- **images** →
  - There are 5 types of pdf files. The pdf file name is the park name and the type of imagery that is being shown. Example: zionaa.pdf, zionveg.pdf, zionveg_large.pdf, zionplots.pdf, grteortho.pdf
- PDF webpage
  - The PDF webpage will always contain the following files: photos.pdf, *parkname*nrpt.pdf. SEE NPSVEG WEB PAGE INSTRUCTIONS FOR FURTHER DETAILS.

The webpages consist of the following files: aa_matrix.xls, field_photos.exe, plots.xls, sp_cov.xls, *parkname*data.mdb (complete dataset), meta*parkname*ortho.txt, meta*parkname*aa.txt, meta*parkname*field.txt, meta*parkname*spatial.txt, meta*parkname*bdy.txt, *parkname*ortho.exe, *parkname*.exe, *parkname*aaexe, *parkname*plot.exe, *parkname*bdy.exe. The following are EXAMPLES: ziondata.mdb, metagrteortho.pdf, metazionaa.txt, metazionfield.txt, metazionspatial.txt, metazionbdy.txt, grteortho.exe, zion.exe, zionaa.exe, zionplot.exe, zionbdy.exe. OPTIONAL: class_matrix.xls. SEE NPSVEG WEB PAGE INSTRUCTIONS FOR FURTHER DETAILS.