U.S. Fish and Wildlife Service

National Spatial Data Infrastructure - Wetlands Layer

National Standards and Support Team

Raster Digitizing Procedures

Contributions to the National Dataset

Technical Procedures

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This document outlines the recommended processing steps necessary to convert raster scans to vector format for incorporation into the Wetlands Data Layer of the National Spatial Data Infrastructure.

Preparing the Data for Vector Conversion

1. Run the Raster Project and Clip script on all scans for the area you are working. The script is located at:

   S:\FWS_Scans\Digitizing\Toolbox.tbx

   This script projects and clips off all unnecessary collar information and prepares the quad for vectorization processing in ArcScan. The input folder is the folder containing the scans to be re-projected (specify the rectified folder you want projected) and the output folder is the new location of the projected images (create a new folder under rectified called 'Projected') (Figure 1). In order for the script to work properly, all rasters must have a defined projection of GCS.

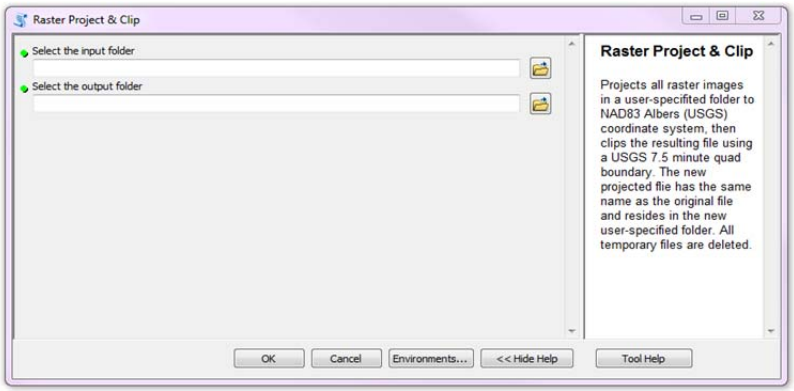
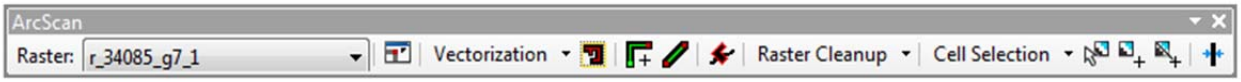


Figure 1: Raster Project and Clip user interface. Simply enter the correct input and output folders.

2. Create a **file** geodatabase within the state folder you are working in and create two feature classes: "CONUS_wet_linear" and "CONUS_wet_poly." When creating these be sure to import the corresponding schema from the MGD.

Converting the Raster to Vector

1. Open an ArcMap session and verify that the ArcScan extension is checked and add the ArcScan toolbar to the ArcMap Session.



2. Open the .mxd called Raster Digitization located at:

   S:\FWS_Scans\Digitizing

3. Set the data source for the CONUS_poly and CONUS_linear layers created for your State as well as the two files pertaining to the first raster you want to convert.

4. Start editing the CONUS_wet_linears layer to activate the ArcScan toolbar.

5. Set Vectorization Settings. Go to Vectorization /Vectorization Settings (Figure 2).

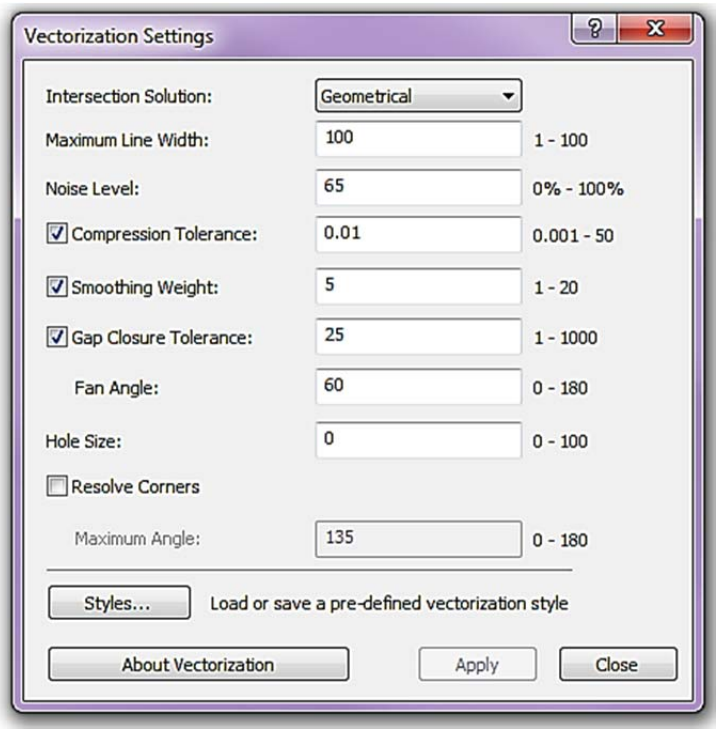


Figure 2: Preferred Vectorization Settings

6. **Generate Features**. Vectorization/Generate Features. Choose CONUS_wet_linears from the drop down box (Figure 3).

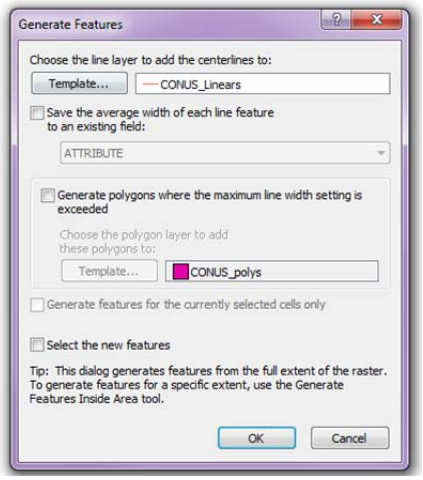


Figure 3: Generate Features Dialog. Leave the Generate polygons box unchecked.

7. **QC Linears**. Once the features are created, save your edits and turn on the corresponding quad layer. Examine all potential polygons along the edge of the quad. Finish off all 'open' wetlands using the line construction tools within the Create Features window (Figure 4). Examine all interior linear features. Fill in missing sections and delete errors. Once the linear sections are all connected, select and merge them together where appropriate.

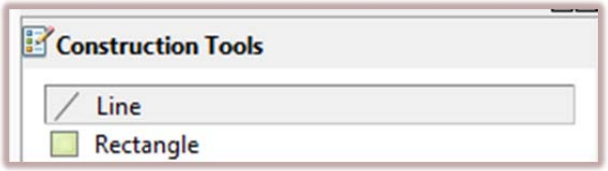
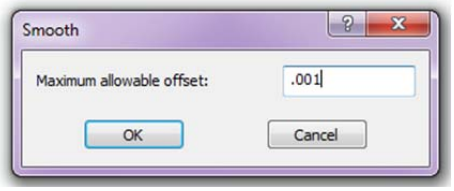


Figure 4: Line Construction Tools used to complete the "polygons" around quad boundaries and existing river features.

Linear Smoothing. If a linear displays a 90 degree angle for a linear feature such as a river or stream, you will want to select that section of the river and apply the automated smoothing tool. After selecting the linear to smooth, click on the smoothing tool. A window will pop up and ask you to enter in the maximum allowable offset. Start by entering .001. If you do not reach the desired amount of smoothness, continue increasing your increments by tenths until you have reached the desired effect (e.g. .01, etc.).



Note: If at any time the linear layer fails to draw when zoomed in, save your edits and close ArcMap. In ArcCatalog, right click and compact the database containing your linear layer. If it still fails to draw, you will need to run the Repair Geometry tool located in ArcToolbox/DataManagement Tools/Features.

8. Once you are satisfied that all linear features are complete and merged select and export all linears into a separate CONUS_wet_linear feature class. Examine all polygon features to ensure there are none missing or only partially complete. Add any missing polygons and close any 'open' features. Once you are confident that the feature line work is correct, open ArcToolbox and go to Data Management/Features/FeaturetoPolygon. Select your linear layer as the Input feature and route the output to the state file geodatabase you are working in. Name the output CONUS_wet_polys_load. Add this feature class to ArcMap and load the polygons into your CONUS_wet_polys feature class in order to obtain the correct schema.

9. Attribute all linears within the CONUS_wet_linear feature class. Begin tagging all polygons with the appropriate attribute. Delete uplands as you go. Fix any errors you may encounter including polygons that may need to be edited due to misrepresentation during vectorization or potentially creating polygons that were missed. Merge any polygons with like attributes that are adjacent.

10. Run the NWI QAQC tool and make corrections accordingly.

    Standard wetland alpha-numeric class code changes to look for before running the verification tool include:

    FL to US
    OW to UB
    SB to US
    BB to US