

Riparian Monitoring Protocol Implementation Plan for Park Units in the Northern Colorado Plateau Network

Standard Operating Procedure (SOP) #10

Vegetated vs Non-vegetated mapping in SCPN

Version SCPN_Riparian_SOP10_20180930

Revision History Log:

Prev. Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #

This SOP is adopted from the Northern Colorado Plateau Network's SOP #18 Vegetated vs. Non-Vegetation mapping in NCPN, Version 1.00 (December 2016) in Perkins, D. W., M. Scott, G. Auble, M. Wondzell, C. Holmquist-Johnson, E. Wahlig, H. Thomas, and A. Wight. 2018. Big River Monitoring Protocol for the Park Units in the Northern Colorado Plateau Network, Version 1.00. Natural Resource Report NPS/NCPN/NRR—2018/1707. National Park Service, Fort Collins, Colorado.

This SOP describes the methods for mapping of vegetated vs unvegetated areas (polygons) along riparian areas in the Southern Colorado Plateau Network (SCPN) to determine if the river channel is narrowing (becoming more vegetated) over time. This mapping takes place along the entire river corridor within the park unit, at least as much of the corridors as are available in the imagery datasets available. These methods are generally most effective in broad alluvial stretches of rivers and are less effective in entrenched meander sections due to the steep walled canyons.

1.0 Imagery Acquisition

In order to create vegetated polygons, aerial imagery must first be obtained. One reliable source of high quality imagery is NAIP (National Agriculture Imagery Program, <https://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/naip-imagery/index>). Since the mid 2000s, NAIP imagery has been completed state-wide during growing seasons every three years, and is available free of charge from USDA Geospatial Data Gateway (<https://gdg.sc.egov.usda.gov/>). Imagery is stored on a SCPN server. Any imagery datasets (potentially from other projects) such as Lidar, or satellite acquisitions can also be used for this mapping effort.

Older imagery datasets occasionally are found, and they too are acquired and stored on an SCPN server. Some older datasets are only in 9x9 hardcopy format, and in order to be used for this project, they are scanned and orthorectified. If orthorectification is too cost prohibitive, the photos are scanned and rubbersheeted, and the output linework should contain metadata noting the base imagery was only rubbersheeted, not rectified.

2.0 Mapping

The mapping of vegetated vs non-vegetated is fairly straight forward. Mapping has been completed in ArcMap, using a geodatabase to store the various years of mapping. The data mapped are only the vegetated polygons visible from the imagery.

SCPN uses the park vegetation maps polygons as the baseline for the mapping of the river corridors as this data has been thoroughly vetted and described in the vegetation map reports. This also allows for a common upland boundary for all years of unvegetated vs vegetated data, which is helpful in area comparisons. Also, it's much simpler to edit existing linework than create new linework. An area was considered vegetated if there was more than 50% cover. Areas were mapped as vegetated if they were greater than .01 hectares (.03 acres).

1. Open and create a project in ArcMap. Add the imagery to be mapped, and the base year feature class (vegetated feature class originally created from the vegetation map data).
2. Create a new feature class in the geodatabase by exporting the feature class based on the vegetation map. Name the exported feature class with the river(s) and imagery date (example: ColoradoGreen_Veg_20110622 = Colorado and Green rivers vegetated areas from 6/22/2011 imagery). The new feature class will be then be edited to reflect the imagery (year) being mapped.
3. In ArcMap, begin an edit session, and using tools such as the “Reshape” tool, begin refining the linework to fit the imagery. Generally, the mapping should take place between 1:2,000 - 3,500 scale. Only edit the river side of the vegetated polygon, leaving the upland side as is. Continue editing until river corridors are complete (Figure 1).

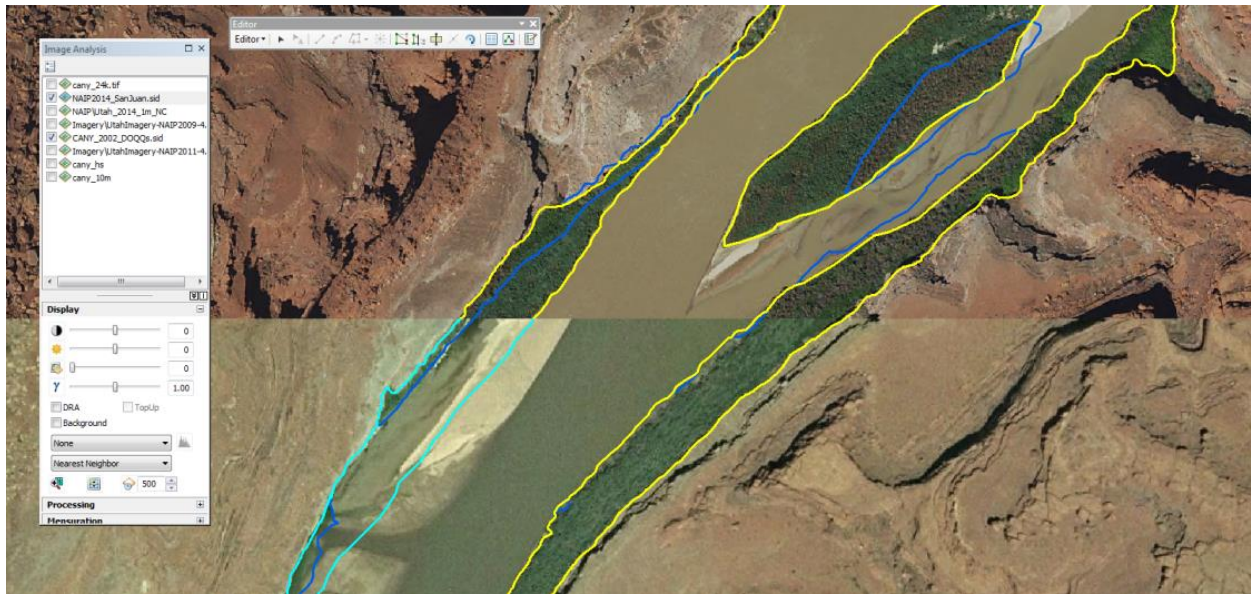


Figure 1. Base linework (2002, blue) and 2014 (yellow) linework and corresponding imagery (2014 imagery top, 2002 imagery bottom)

4. Once all the line editing is completed, calculate Acres and Hectares in the attribute table.
5. Create metadata stating which year the feature class represents, when it was completed and other relevant metadata details.