Supplemental Map Information (User Report)

Project ID: R05Y07P11

Project Title or Area: Pigg River

Photointerpretation: Conservation Management Institute (Contractor)

Personnel: Pamela Swint, Kevin McGuckin, Scott Klopfer, Beth Pokorski –Conservation Management Institute, Virginia Tech, Blacksburg VA

Source Imagery (type, scale and date):
Virginia Base Mapping Project (VBMP) true-color aerial imagery from 2001
DOQQ (1-meter) CIR imagery from 1994-1995 (used for both wetland change detection and wetland identification)

Date Started: 05/01/07
Date Completed: 07/04/07
Number of 24k quads: 11 (*plus 2 partial USGS quads)
Endicott, Ferrum, Boones Mill, Rocky Mount, Redwood, Gladehill, Penhook, Smith Mountain Dam, Sandy Level, Callands, Pittsville, Callaway*, Leesville *

Collateral Data (include any digital data used as collateral):
NHD, SSURGO (Hydric Soils), DRG, NED (10m)

Inventory Method (original mapping, map update, techniques used):
Mapping was performed for the Pigg River Watershed using a combination of automated feature extraction (Feature Analyst software) and heads-up digitization. Feature Analyst was used initially to locate easily identifiable open water areas using the CIR DOQQ (using Feature Analyst on the true-color imagery available proved to be too difficult due to the similarities of color between water and exposed soil). Wetlands were identified at a minimum zoom scale of 1:5000. We identified water features at a scale of ¼ acre, and ½ acre for vegetated wetlands. Old NWI data was used when available to identify additional wetland locations although the old NWI codes were not always used. If a wetland existed in the DOQQ but was not obvious from the VBMP, it was kept as a wetland as long as the land type did not change. Linear features from the NHD dataset were used as stream and river vector features, and were manually corrected for spatial issues, and attributed according to the Cowardin system. Additional ancillary data included ten meter NED and DRG contours, both of which identified areas of steep slope and wetland connectivity. During the initial photo-interpretation, we identified water connectivity (isolated, through-flow, out-flow…etc) to be used for later LLWW classifications.

Classification (Cowardin wetlands, riparian, uplands, hydrogeomorphic, etc.):
CMI used the Cowardin *et al.* (1979) system for wetlands and deepwater habitats.

Data Limitations:

General description of the Project Area:
(http://www.fs.fed.us/colorimagemap/ecoreg1_provinces.html)
Southern Mixed Forest Province
Southeastern United States, 193,000 mi2 (499,900 km2)
Land-surface form.--This province comprises the Piedmont and the irregular Gulf Coastal Plains, where 50 to 80 percent of the area slopes gently toward the sea. Local relief is 100 to 600 ft (30 to 180 m) on the Gulf Coastal Plains, and 300 to 1,000 ft (90 to 300 m) on the Piedmont. The flat coastal plains have gentle slopes and local relief of less than 100 ft (30 m). Most of the numerous streams in the region are sluggish; marshes, lakes, and swamps are numerous.

Climate.--The climate is roughly uniform throughout the region. Mild winters and hot, humid summers are the rule; the average annual temperature is 60 to 70F (15 to 21C). The growing season is long (200 to 300 days), but frost occurs nearly every winter. Precipitation, which averages from 40 to 60 in (1,020 to 1,530 mm) annually, is rather evenly distributed throughout the year, but peaks slightly in midsummer or early spring, when it falls mostly during thunderstorms. Precipitation exceeds evaporation, but summer droughts occur. Snow falls rarely and melts almost immediately.

Vegetation.--Climax vegetation is provided by medium-tall to tall forests of broadleaf deciduous and needleleaf evergreen trees. At least 50 percent of the stands are made up of loblolly pine, shortleaf pine, and other southern yellow pine species, singly or in combination. Common associates include oak, hickory, sweetgum, blackgum, red maple, and winged elm. The main grasses are bluestem, panicums, and longleaf uniola. Dogwood, viburnum, haw, blueberry, American beautyberry, youpon, and numerous woody vines are common. The West Gulf Coast is bordered along its shores by salt marshes characterized by the marsh grass Spartina.

Soils.--Ultisols dominate throughout the region, with locally conspicuous Vertisols formed from marls or soft limestones. The Vertisols are clayey soils that form wide, deep cracks when dry. Inceptisols on floodplains of the major streams are among the better soils for crops.

Fauna.--Fauna vary with the age and stocking of timber stands, percent of deciduous trees, proximity to openings, and presence of bottom-land forest types. Whitetail deer and cottontail rabbits are widespread. When deciduous trees are present on uplands, the fox squirrel is common. Gray squirrels live along intersecting drainages. Raccoon and fox inhabit the whole region and are hunted in many areas. Among mammals frequently encountered in the western part of this province is the nine-banded armadillo.

The eastern wild turkey, bobwhite, and mourning dove are widespread. Of the 20-odd bird species present in mature forest, the most common are the pine warbler, cardinal, summer tanager, Carolina wren, ruby-throated hummingbird, blue jay, hooded warbler,

eastern towhee, and tufted titmouse. The red-cockaded woodpecker is an endangered species.

Forest snakes include cottonmouth moccasin, copperhead, rough green snake, rat snake, coachwhip, and speckled kingsnake. Fench and glass lizards are also found, as is the slimy salamander.

Description of wetland habitats:

Organize by Cowardin classification type:

Wetland classification codes and corresponding community type(s):

Description of other habitats:

Riparian:

Uplands:

List of wetland plant species with indicator status:

Regional specialized conventions:

- The "E" water regime describes wetland hydrology that is seasonally-flooded/saturated.
- The "Rx" code is used for ditches crossing wetlands and for non-vegetated ditches within non-tidal wetlands.

Comments

On-screen image interpretation involved the following tasks: manual identification/attribution/deletion/editing of polygons created by Feature Analyst; addition of missed wetlands; expansion and/or reduction of polygon boundaries created by Feature Analyst; attribution and re-alignment of hydrography, and removal of linear hydrography through permanently-flooded and semi-permanently flooded polygons; application of water regime special modifiers to describe disturbed and altered wetlands and deepwater habitats: ditching, impoundment (to include tidally restricted habitats), spoil deposition, beaver, excavation, and artificial water control.

SSURGO hydric soils were only used to identify potential wetland areas, since only partial hydric soils were available for the region.

LLWW classifications were based on Tiner (2003) and also from a simplified classification scheme developed by Ralph Tiner (FWS). To reduce human error and standardize the process, a model was created within the GIS to assign the LLWW values. This model derived its values primarily from a combination of Cowardin classification, photo interpreted attributes, NHD linears, and the spatial location of the wetlands. The Cowardin classifications were used to determine the largest number and variety of attributes, ranging from Waterbody Type to Landform. Spatially, attributes were assigned to adjoining wetlands in related areas, such as where non-waterbody wetlands along a lake are classified as 'LE' (lentic). Intermittent flow and the gradients of the Lotic Stream wetlands were determined by spatial proximity to the NHD linears and the corresponding gradients. And the photo interpreted attribute 'flow' was the primary

determinant in the attribute of Water Flow Path. In some cases all factors were utilized, while in others one factor took precedence, per the classification systems. The final step combined the model-assigned attributes with additional photo interpreted modifiers for the LLWW classification of each wetland.

A change detection analysis was performed to determine the extent and type of change of wetlands over the past 10-15 years. Changes between the DOQQs (1994-5) and the VBMP (2001) were determined using an image-to-image analysis. Initially, the new wetland layer (based from the VBMP imagery) was draped over the DOQQs. The DOQQs were then scanned for significant differences between the wetland layer and the old image. If a noticeable change was observed (a pond observed in the DOQQ, but no matching polygon in the new layer), it was first checked to determine if the wetland was simply missed in the new classification. If the wetland was not missed, it was labeled as a 'lost' wetland, and an Anderson Land Use Code (Anderson et. al, 1976) was added to indicate the current land type (residential, commercial…etc). Likewise, if a pond was not present in the DOQQ, but a polygon existed in the new layer, it was labeled as a 'gained' wetland. Using this technique provided an accurate and systematic way of scanning for wetland changes.

Other discussion of mapping issues (image quality, water conditions, etc.):

References:

Anderson, J.R., E.E. Hardy, J.T. Roach and R.E. Witmer. 1976. A Land Use and land Cover Classification System for Use with Remote Sensor Data. U.S. Geological Survey Professional Paper 96A. U.S. Government Printing Office, Washington, D. C. 28 pp.

Cowardin, L.M., V. Carter, F.C. Goulet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. Office of Biological Services, Fish and Wildlife Service, US Department of the Interior, Washington D.C.

Tiner, R. W. 2003a. Dichotomous keys and mapping codes for wetland landscape position, landform, water flow path, and waterbody type descriptors. U.S. Fish and Wildlife Service, National Wetlands Inventory Program, Northeast Region, Hadley, MA, USA,

US Forest Service Website, Ecosystem Provinces - http://www.fs.fed.us/colorimagemap/ecoreg1_provinces.html (viewed 5/15/07)