Supplemental Map Information (User Report)

Project ID: R05Y06P09

Project Title or Area: New York Bog Turtle Update

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):
CIR 1ft 2004 aerial ortho-imagery (Dutchess County); CIT 2ft 2001 aerial ortho-imagery (Columbia County), obtained from the New York State GIS website (http://www.nysgis.state.ny.us/gateway/mg/)

Date Started: 08/01/06
Date Completed: 05/01/07
Number of 24k quads: 10
Amenia, Copake, Dover Plains, Millbrook, Millerton, Pine Plains, Pleasant Valley, Rock City, Salt Point, Verbank

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 Dutchess and Columbia County 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 and vegetated wetlands (primarily E and F regimes). The results from the vegetated wetlands were clipped using the SSURGO hydric soils, which decreased the amount of incorrectly identified wetlands created by Feature Analyst (and also decreased processing time). The majority of vegetated wetlands outside of these hydric soils were manually interpreted. 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. 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:
(\hspace{100pt} http://www.fs.fed.us/colorimagemap/ecoreg1_provinces.html )
Eastern Broadleaf Forest (Oceanic) Province
Appalachian Plateaus, New England lowlands, mid-Atlantic coastal plain, Piedmont Plateau

**Land-surface form.**--This province includes topography of diverse nature and origin. The northern part has been glaciated. West of the Appalachian Mountains are the Appalachian Plateaus. The sedimentary formations there are nearly horizontal, a typical plateau structure, but they are so elevated and dissected that the landforms are mostly hilly and mountainous. Altitudes range from about 1,000 ft (300 m) along their western edge to somewhat more that 3,000 ft (900 m) on the eastern edge. East of the mountains is the Piedmont Plateau and coastal plain, where altitudes range from sea level to about 1,000 ft (300 m).

**Climate.**--The continental climatic regime here ensures a strong annual temperature cycle, with cold winters and warm summers. Average annual temperatures range from 40 to 60°F (4 to 15°C). There is year-round precipitation, averaging from 35 to 60 in (890 to 1,530 mm) per year. Precipitation is markedly greater in the summer months, when evapotranspiration is great and moisture demands are high. Only a small water deficit is incurred in summer, whereas a large surplus normally develops in spring.

**Vegetation.**--This province is characterized by a winter deciduous forest (sometimes called temperate deciduous forest) dominated by tall broadleaf trees that provide a dense, continuous canopy in summer and shed their leaves completely in winter. Lower layers of small trees and shrubs develop weakly. In spring, a luxuriant ground cover of herbs quickly develops, but is greatly reduced after trees reach full foliage and shade the ground. Forest vegetation is divided into three major associations: mixed mesophytic, Appalachian oak, and pine-oak.

Mixed mesophytic vegetation, the deciduous forest with the greatest diversity, occupies moist, well-drained sites in the Appalachian Plateaus. Widespread dominants include American beech, tuliptree (also called yellow-poplar), several basswoods, sugar maple, sweet buckeye, red oak, white oak, and eastern hemlock, in addition to 20-25 other species. The best indicators of this association are buckeye and basswood.

The Appalachian oak association occurs east of the mountains. The dominant species are white oak and northern red oak. Chestnut formerly was abundant, but a blight has destroyed most of this species.

**Pine-oak forest**--sometimes called "Pine Barrens"--occupies dry sandy soils that are frequently exposed to naturally occurring fires along the northern Coastal Plain. There is a thick shrub layer beneath the pines. Atlantic white-cedar swamps occur on mesic sites.
Soils.--The pedogenic process associated with deciduous forest is podzolization, moderated by warm wet winters. As a result, soils are characteristically Alfisols. Toward lower latitudes, the tendency to laterization becomes stronger and Ultisols are encountered. Inceptisols are found on the plateaus. In the deciduous forests, a thick layer of leaves covers the ground and humus is abundant.

Fauna.--Important mammals include the whitetail deer, black bear, bobcat, gray fox, raccoon, gray squirrel, fox squirrel, eastern chipmunk, white-footed mouse, pine vole, shorttail shrew, and cotton mouse.

Bird populations are large. The turkey, ruffed grouse, bobwhite, and mourning dove are game birds in various parts of the province. The most abundant breeding birds include the cardinal, tufted titmouse, wood thrush, summer tanager, red-eyed vireo, blue-gray gnatcatcher, and Carolina wren.

Characteristic reptiles include the box turtle, common garter snake, and timber rattlesnake.

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 “5” emergent subclass is used to identify Phragmites australis.
- 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, artificial water control; identification and attribution for the presence of Phragmites australis.
SSURGO hydric soils were added to the dataset after the wetland classification had been completed. First, soils were deleted where wetlands had previously been identified. Road centerlines were buffered by 8 meters and removed from the hydric soil dataset. Remaining hydric soil areas that were less than 1 acre (and did not create undesirable holes between the hydric soils and wetlands) were deleted from the dataset. The hydric soils were photo-interpreted and classified to the Cowardin et al. (1979) system with the addition of an ‘H’ prefix to the code. Hydric soil water regime attribution was based on a crosswalk of soil types to water regime developed by R. Tiner (FWS). Developed hydric soils were deleted from the dataset. Polygons within the SSURGO dataset that identified open water were also included in this addition to prevent the creation of artificial gaps within the data. Two different datasets were maintained, one with soils types merged, and one dataset that retained different soil types. Both of these datasets were maintained as a separate and distinguishable dataset from the photo-interpretable wetlands.

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 to wetlands over the past 30 years. The analysis was based solely on the recent imagery available and the classification and extents of NWI data from the 1970s. Older imagery was not available to include in this change detection. Only discernable changes were recorded, these included the creation of new water features, large changes in the extents of water features, and developed wetlands areas. Two new fields were created that contained the results from the change detection ‘Trend’ and ‘Change’. Within the ‘Trend’ field, wetlands were recorded as being ‘lost’, ‘new’, or ‘changed’. Anderson et al. (1976) land use codes were specified within the ‘Change’ field if the wetland was developed or lost. Wetlands were also recorded as being ‘impounded’ or ‘excavated’ if h or x modifiers were present in the wetland code, respectively. Wetlands that were new only from the change in scale of wetland mapping were not considered as new wetlands. Results from the change detection (lost, added, altered wetlands) were imported into a new feature class within the final geodatabase.

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


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)