

THE USE OF GIS DATA AND ANALYSIS IN THE DEVELOPMENT OF THE MOHAWK RIVER WATERSHED MANAGEMENT PLAN

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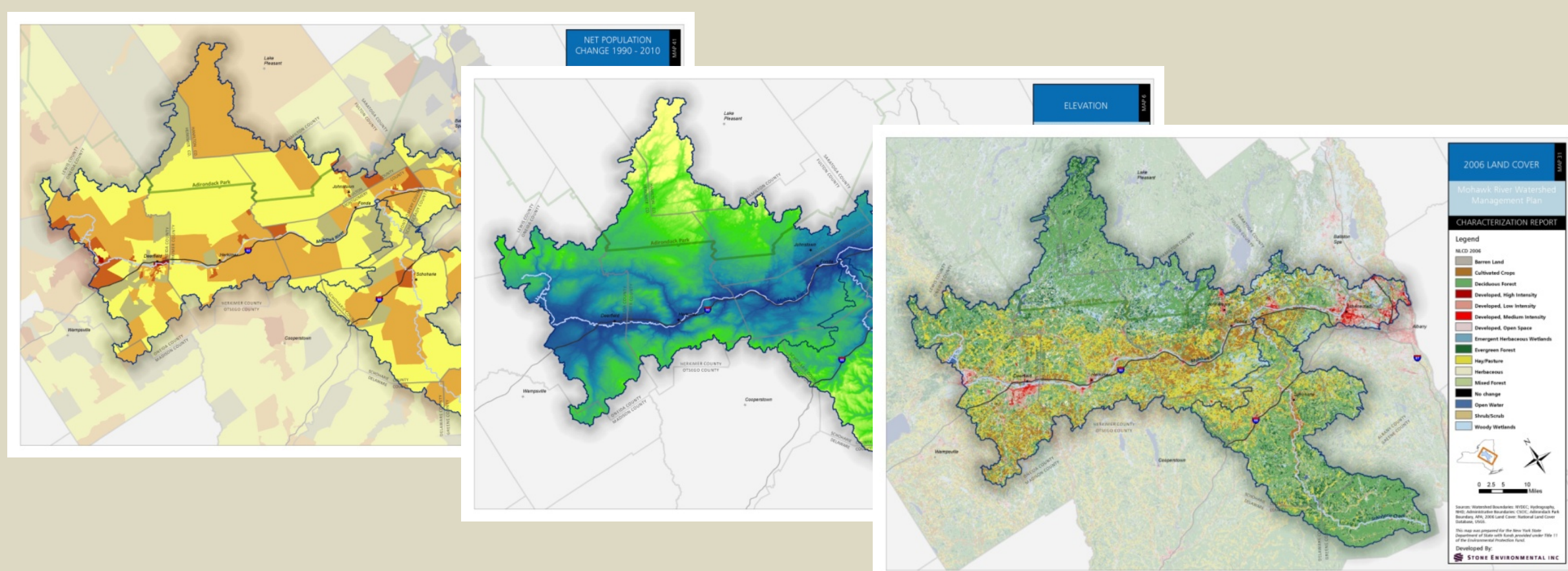
GIS NEEDS FOR WATERSHED PLANNING IN THE MOHAWK

In 2011, Stone worked with the Mohawk River Watershed Coalition of Conservation Districts (MRWC) to compile, develop, and illustrate relevant GIS datasets to the Mohawk River watershed, including ecological, social, and economic information. The MRWC received funding to develop a Watershed Management Plan for the Mohawk River Watershed. Geographic Information Systems (GIS) data will play an important role in the development and implementation of the management plan. GIS needs for watershed planning in the Mohawk are:

- Use of GIS to develop the characterization report and the watershed management plan.
- Use of maps to involve stakeholders and to carry out the plan.
- Use of GIS data to analyze impacts of physical features, ecosystem features, and management activities within the basin.

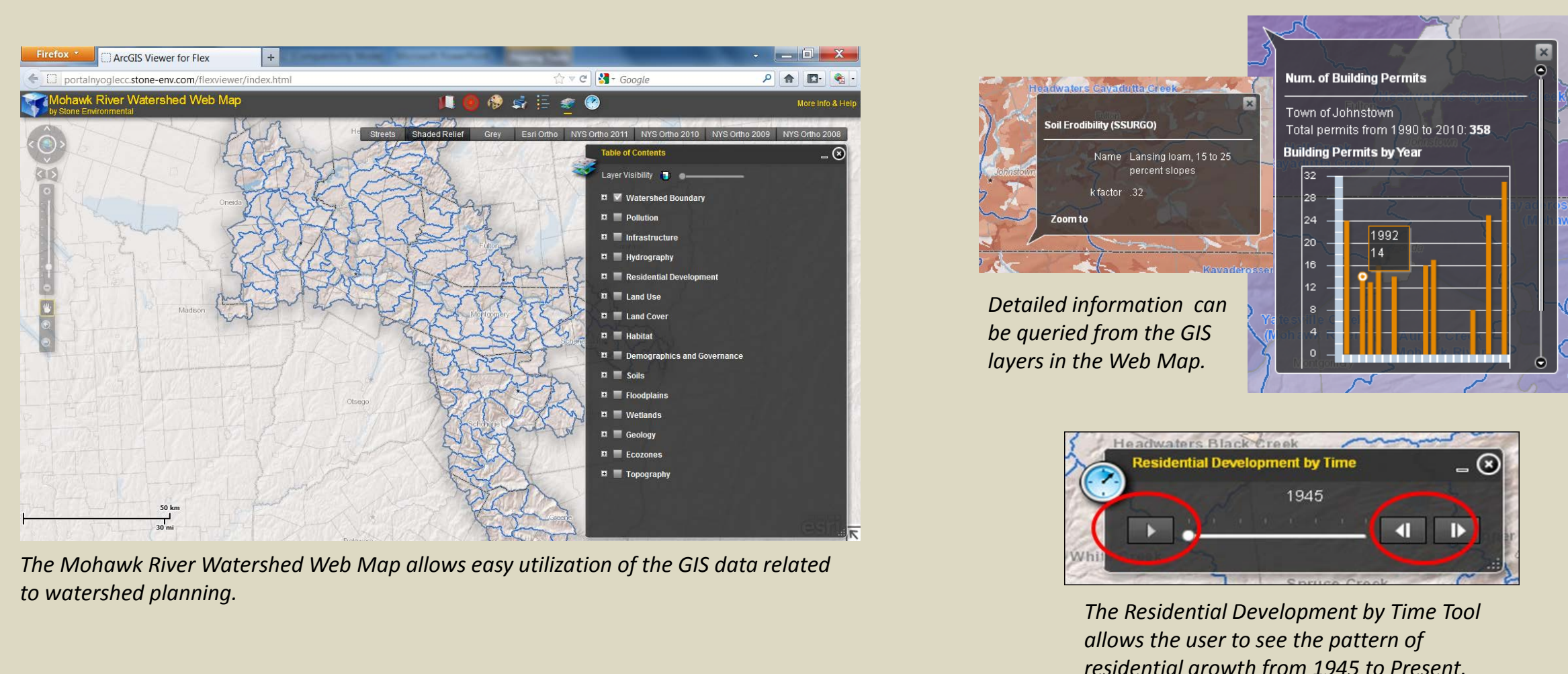
Data Collection, Compilation, and Mapping

- 58 GIS datasets were collected, compiled and mapped using a custom map template.



Mohawk River Watershed Web Map

- 58 GIS datasets viewable in the Web Map
- Bookmarking, drawing, and printing tools
- A custom 'Residential Development by Time' visualization tool

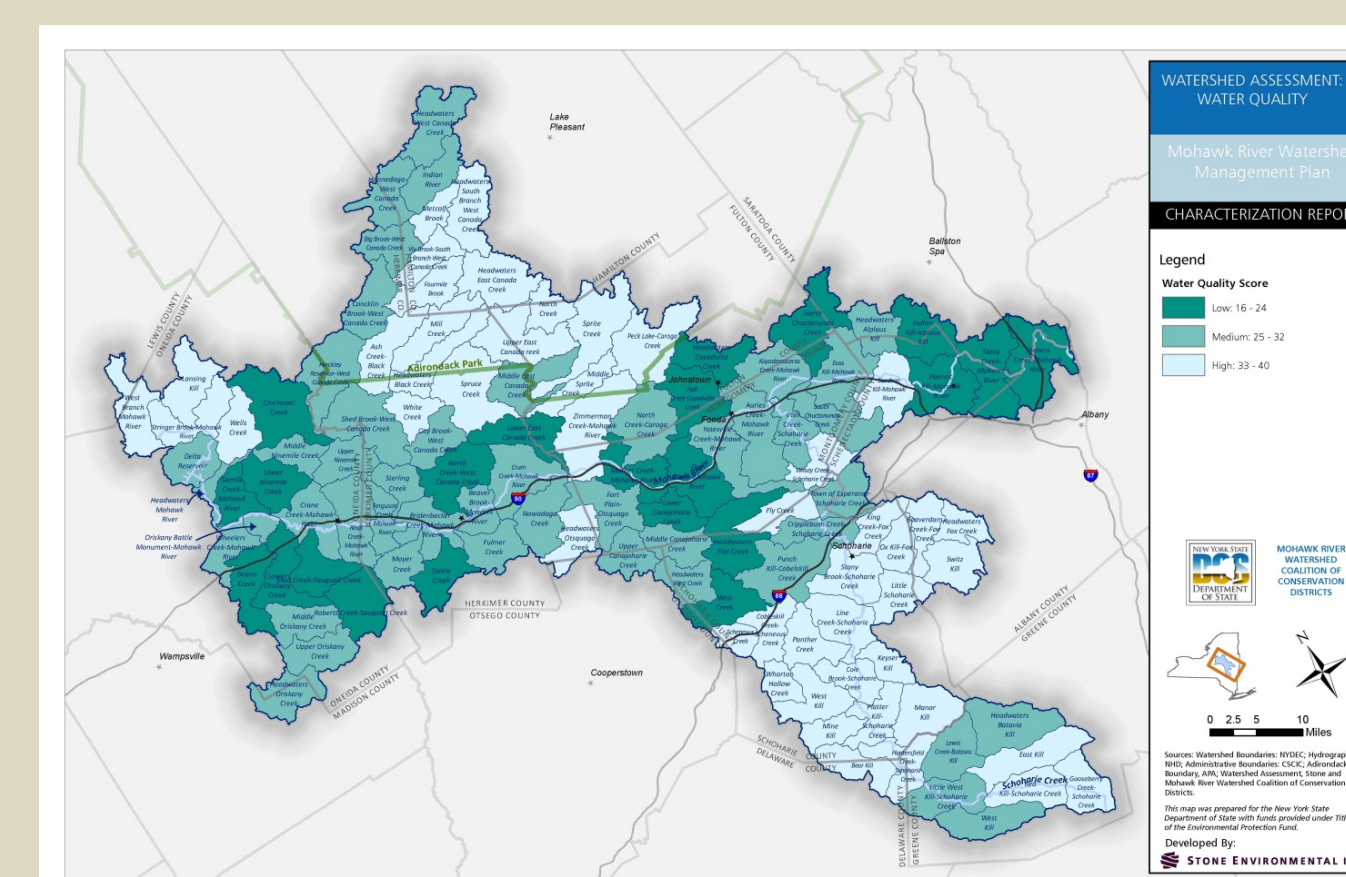


Sub-Watershed Assessments

Sub-watershed assessments of water quality, land use, and habitat were completed to determine relative watershed health at the Hydrologic Unit Code (HUC) 10 and HUC 12 watershed levels, as well as at a regional level. A scoring system was developed to assess sub-watershed health by evaluating a total of fifteen (15) GIS datasets, which were categorized as water quality, land use, or habitat components.

Water Quality

Water quality was determined to be the most important component of the assessment and weighted more heavily than the other components (2.0). The overall water quality score was based on the factors and source datasets in the adjacent table:



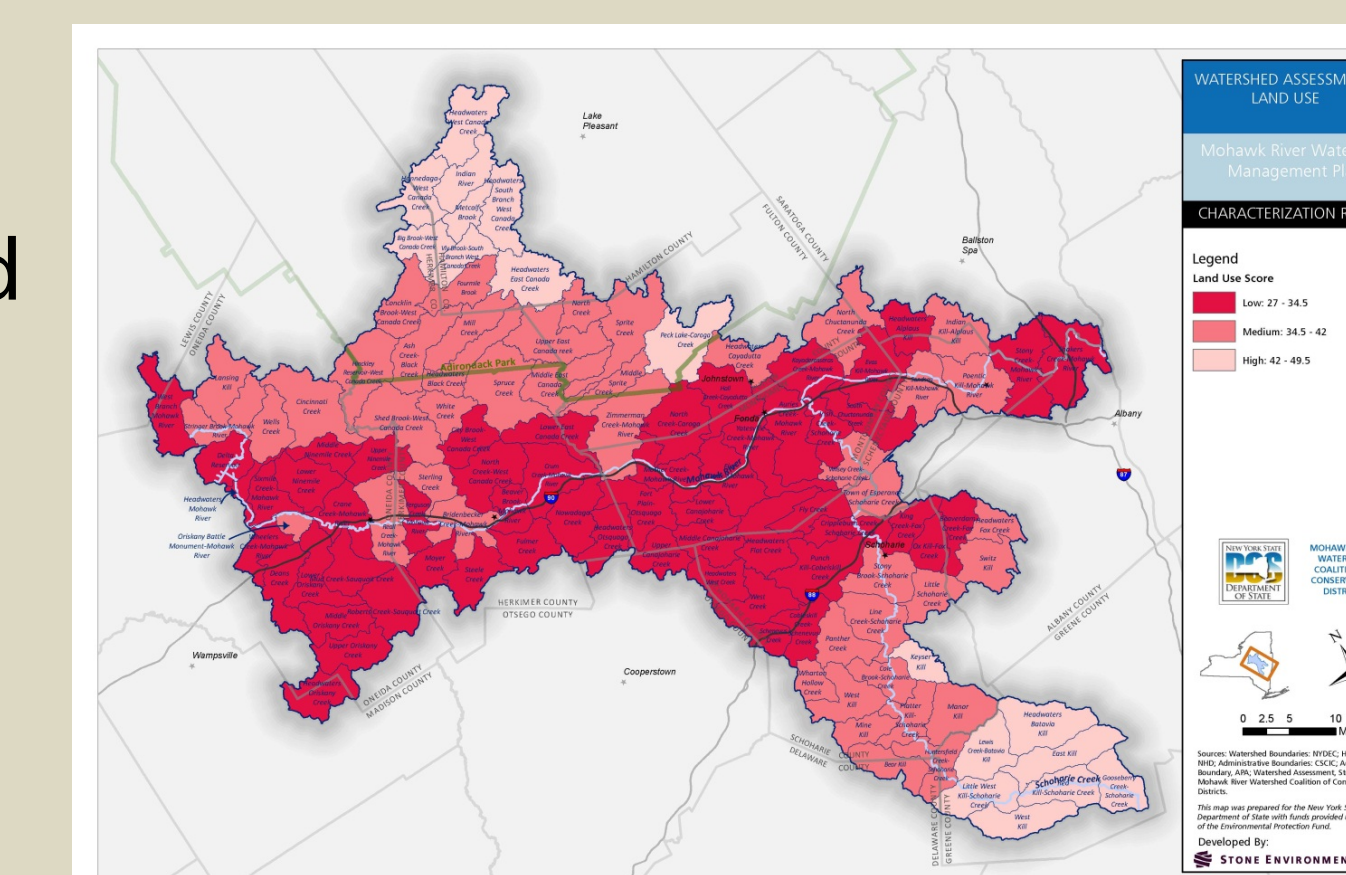
Water Quality Factor	Source GIS Dataset
% of Impaired Streams	DEC W/PWL Data
% Ground Water Recharge	NY Dept. of Health Principal Aquifers
% Wetland / Forest	2006 NLCD Land Cover Data
% Riparian	2006 NLCD Land Cover Data and NHD Streams



While the East Kill sub-watershed has excellent water quality, a portion of the East Kill watershed has cropland bordering streams (left). The majority of the East Kill watershed has forested riparian cover (right).

Land Use

Similarly, land use components were weighted by 1.5. The overall land use score was based on the factors and source datasets in the table below:



Land Use Factor	Source GIS Dataset
% Agriculture	2006 NLCD Land Cover Data
Soil Erodibility	NRCS SSURGO Soils Data (K-factor)
Livestock per Acre of Pasture	Animal-unit data, USDA
% Forest	2006 NLCD Land Cover Data
% Urban	2006 NLCD Land Cover Data
% Impervious	2006 NLCD Impervious Surface Data
% Change in Residential Development since 1990	NY ORPS Assessor data

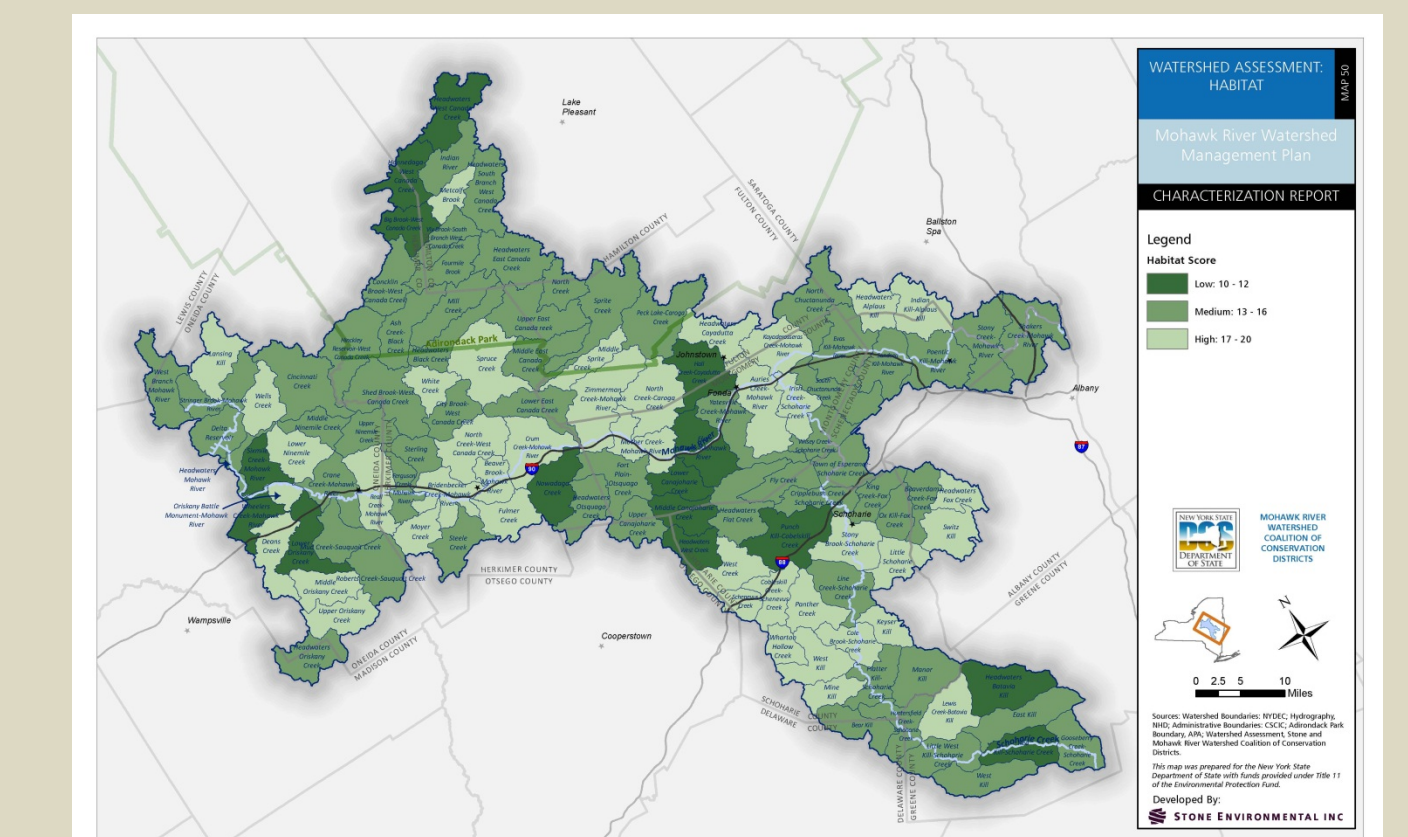


Higher numbers of livestock per acre is frequently a problem in the southern half of North Creek/Caroga Creek watershed, as seen here in this photo of a dairy farm on State Route 10.

Sub-Watershed Assessments, cont.

Habitat

Habitat components were weighted by 1.0. The overall habitat score was based on the factors and source datasets in the table below :

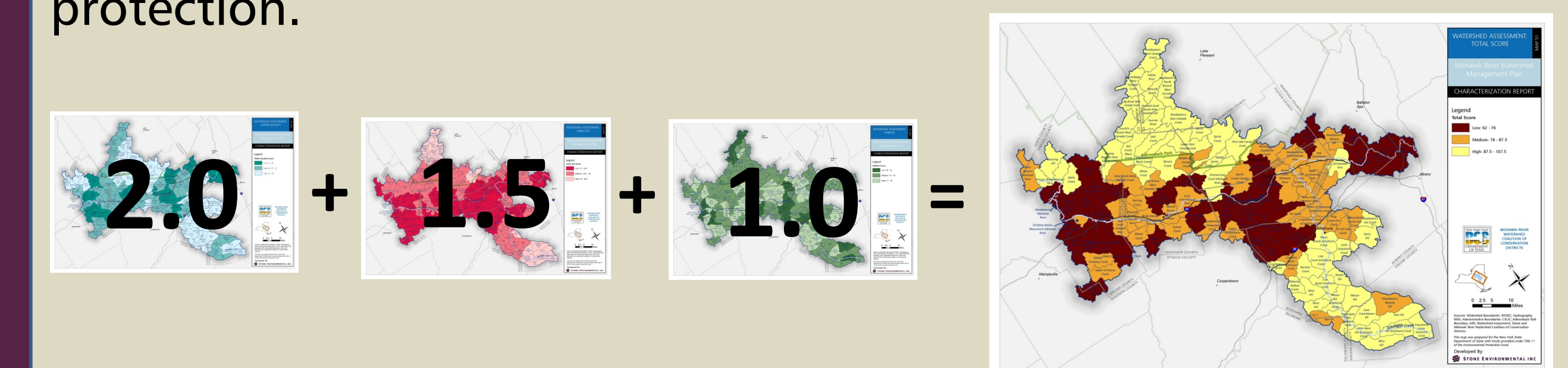


The hydroelectric power plant and dam in Ephratah causes fluctuations in the water flow of the lower Caroga Creek, resulting in minor impacts to habitat hydrology.

Habitat Factor	Source GIS Dataset
% Aquatic Life Precluded, Impaired, or Stressed	DEC W/PWL Data
% Intolerant Fish Species	Index of Biotic Integrity (IBI) Data
In-Stream Habitat Altered, Moderate, or Severe	DEC In-stream Monitoring Data
Endangered Species Observations	National Heritage Foundation Endangered Species Observations

Overall Watershed Assessment Scores

The total sub-watershed scores were developed by summing the weighted **water quality**, **land use**, and **habitat** scores. Using the total scores, sub-watersheds were categorized as low, medium, or high. Low scores are considered an indication of unhealthy sub-watersheds, in need of restoration. Medium scores suggest sub-watersheds with a mix of unhealthy and healthy conditions and in need of both restoration and protection. High scoring sub-watersheds are considered to be healthy and in need of protection.



GIS IN THE MOHAWK RIVER WATERSHED MANAGEMENT PLAN

Over the past year, the MRWC, made up of fourteen districts, has been utilizing and interpreting the GIS data and sub-watershed assessments to develop the management plan. Each district has completed an assessment by interpreting the HUC 12 sub-watershed scores, summarizing the conditions indicated by the scores, and further recommending actions for restoring and/or protecting portions of the Mohawk River. Additionally, the overall management plan utilizes sub-watershed assessment information at the HUC 10 level and also for three regions of the Mohawk River watershed including the Upper Mohawk, the Main River, and the Schoharie Watershed.