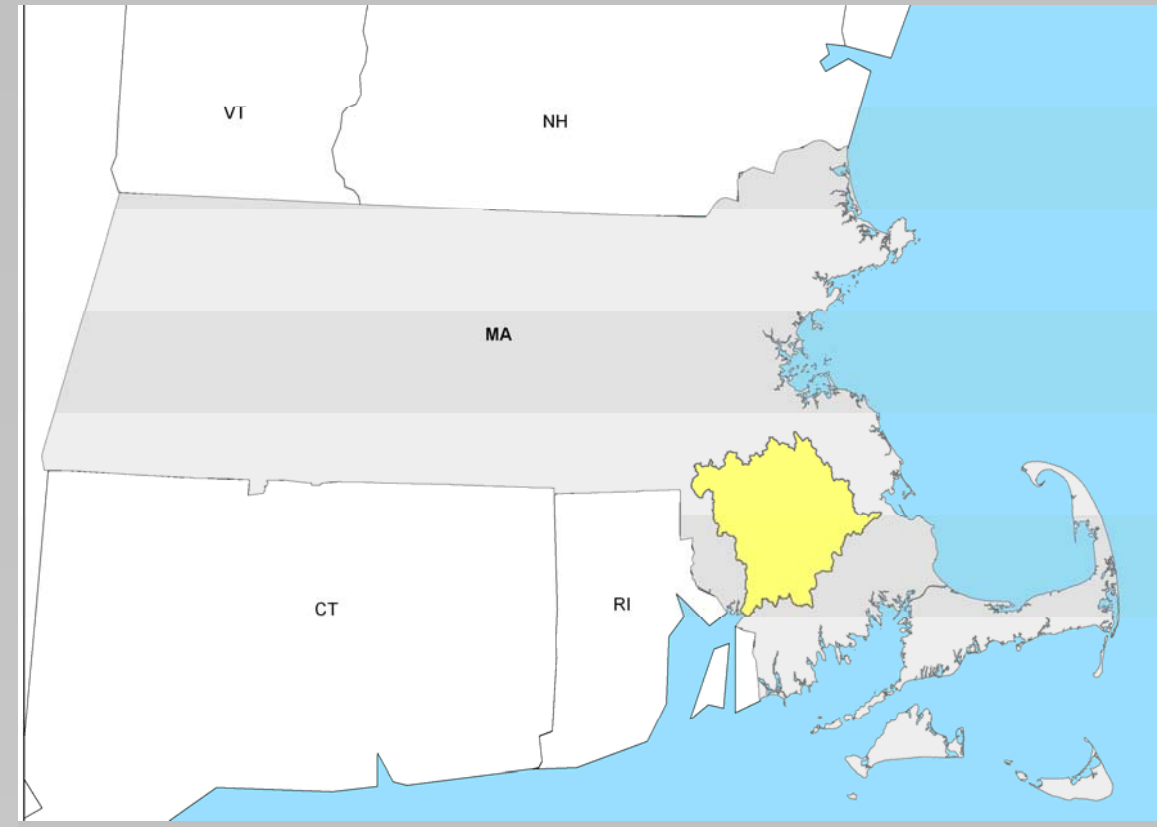


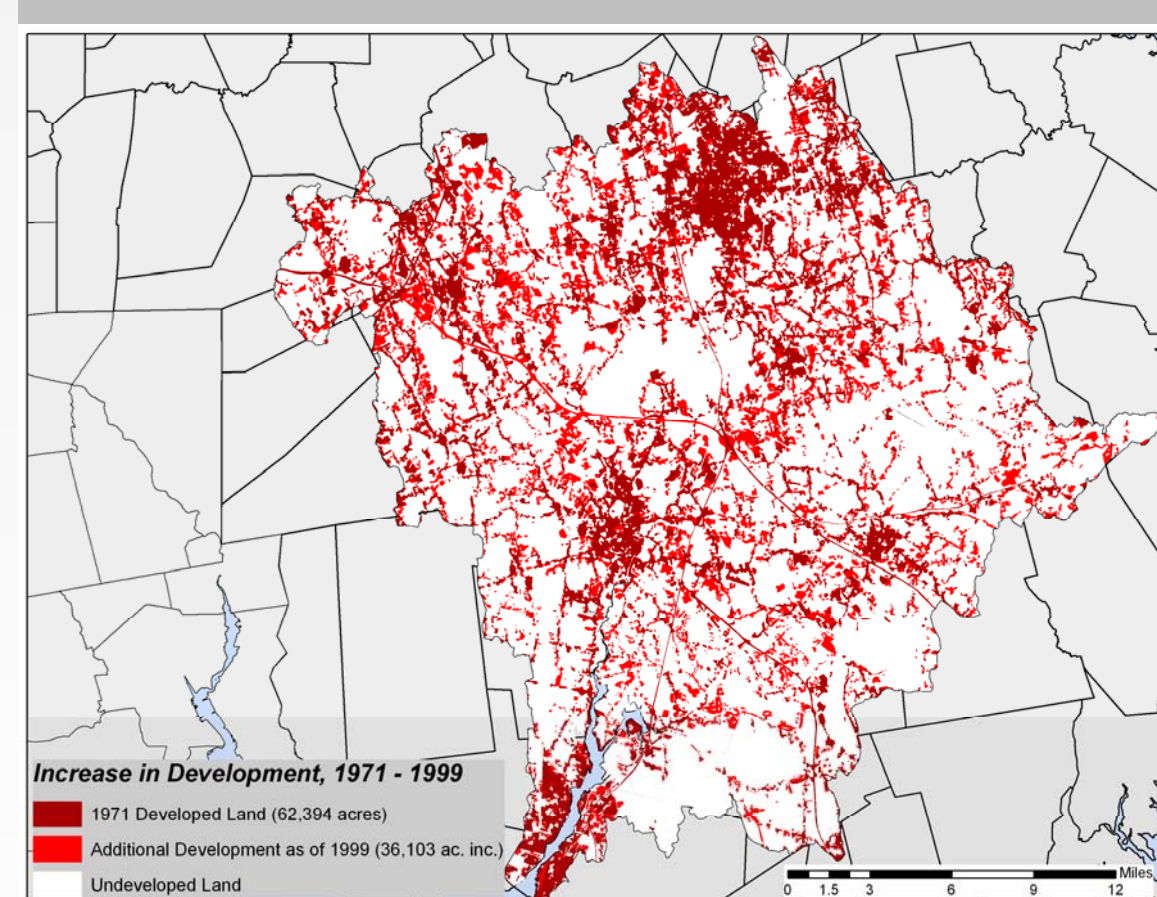
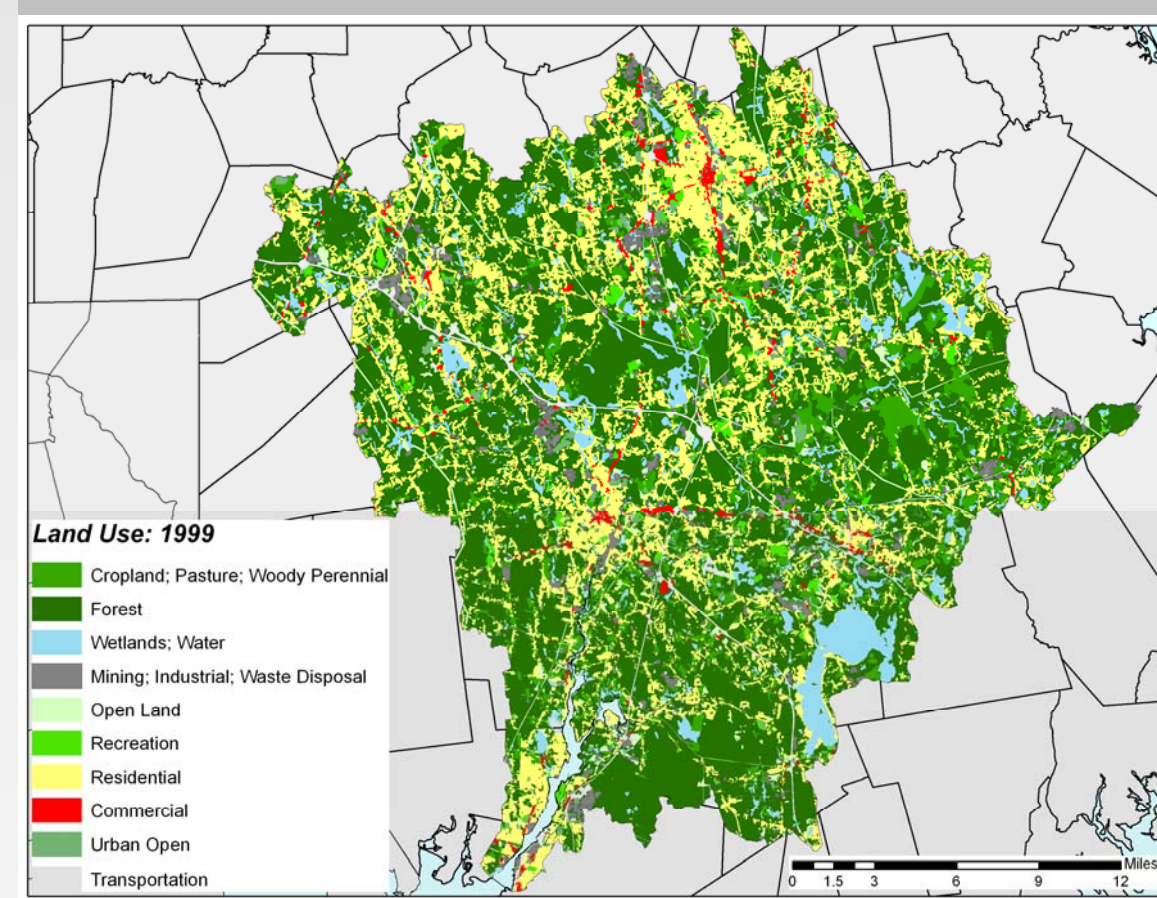
Two Scenarios for Wetlands Protection and Restoration in the Taunton River Watershed: Where Does the Massachusetts Pilot Wetlands Mitigation Banking Project Fit In?



The Wetland Mitigation Banking Concept:

Wetlands provide important environmental services such as filtering of pollutants, flood control, and habitat for wildlife. The Clean Water Act prohibits the discharge of dredged or fill materials into waters of the United States, including wetlands, without the authorization of the Army Corps of Engineers. As part of the development permitting process, developers and regulators determine if wetlands will be negatively impacted as a result of the development. This destruction must first be avoided and minimized, but if it is considered unavoidable, approval of the development will often require compensatory wetland mitigation. This mitigation can either be performed by the developer on or near the development site or the developer can pay to use a wetland mitigation bank that has already established wetlands (based on a regulatory assessment of the site). Mitigation banks must be approved by federal and state regulatory agencies. The bank in the Taunton River Watershed is the first of its kind in Massachusetts. There are many controversies related to wetland mitigation in general such as functional equivalency issues and proper oversight. Mitigation banks in particular have been criticized for resulting in the shift of environmental services from urban to rural areas.

Current Land Use and Development Change:



Tufts Department of Urban & Environmental Policy & Planning (UEP)
Introduction to GIS, Fall 2007
Cartographer: Erin Smyth
Data source: Mass GIS
Map projection: NAD 1983 State Plane Massachusetts Mainland FIPS 2001

Project Description:

In 2004 Massachusetts established a Pilot Wetlands Banking Project in the Taunton River Watershed. The project is located on a large cranberry bog known as Bog 18 in Hanson, MA. Hanson is one of 43 communities within the Taunton River Watershed that will be impacted by this pilot project as development impacts on wetlands within the watershed will be offset by establishment or revitalization of wetlands at Bog 18. The purpose of this project was to analyze two different scenarios for wetlands protection based on different wetlands values and determine where the mitigation banking site fits in.

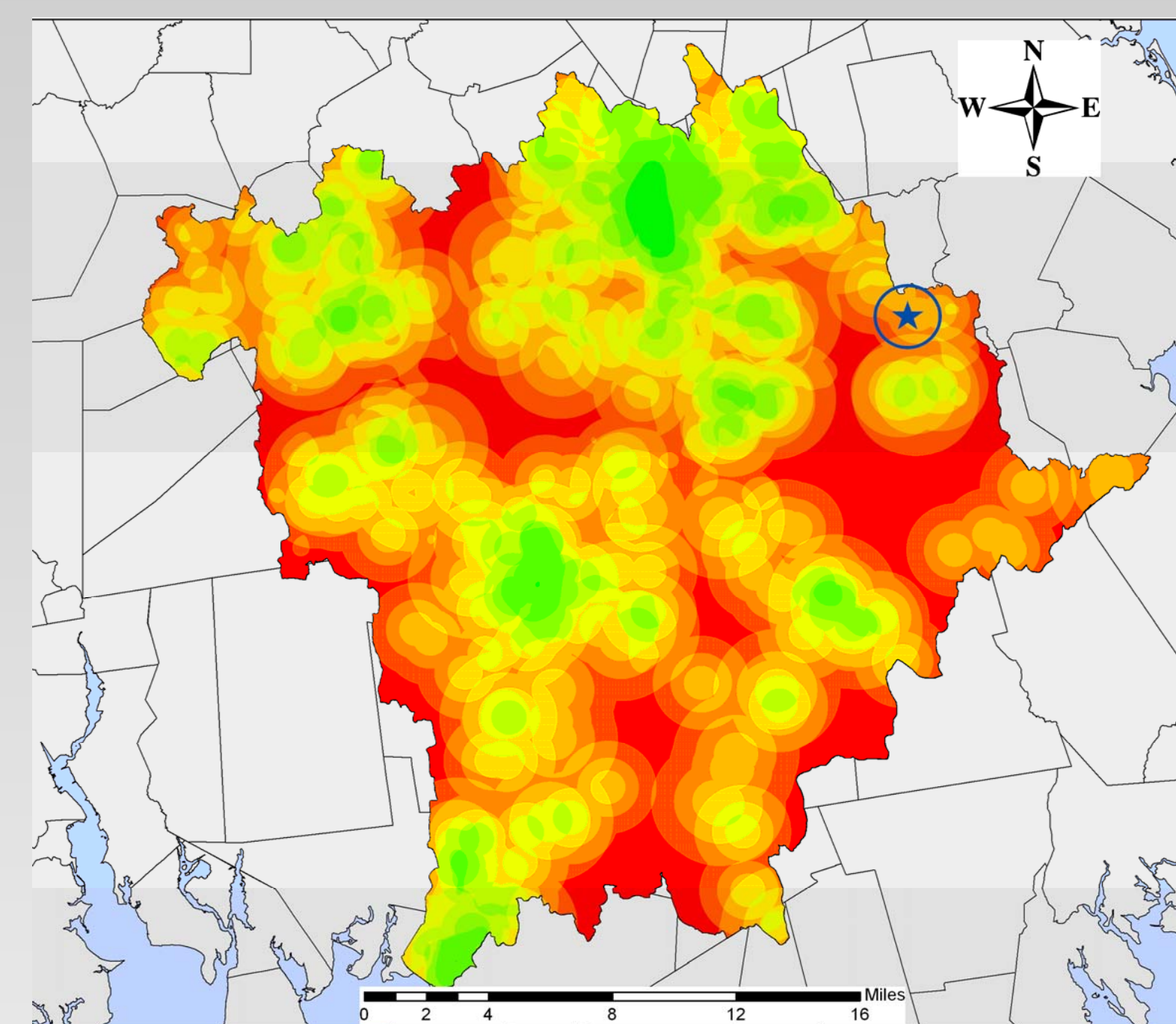
Scenario 1: Wetlands as Environmental Services to Society

This scenario places a high value on wetlands as providing environmental services to the areas in which they are located such as filtering pollutants, flood control, and environmental education. This scenario includes those wetlands close to population density, schools, and hazardous waste sites.

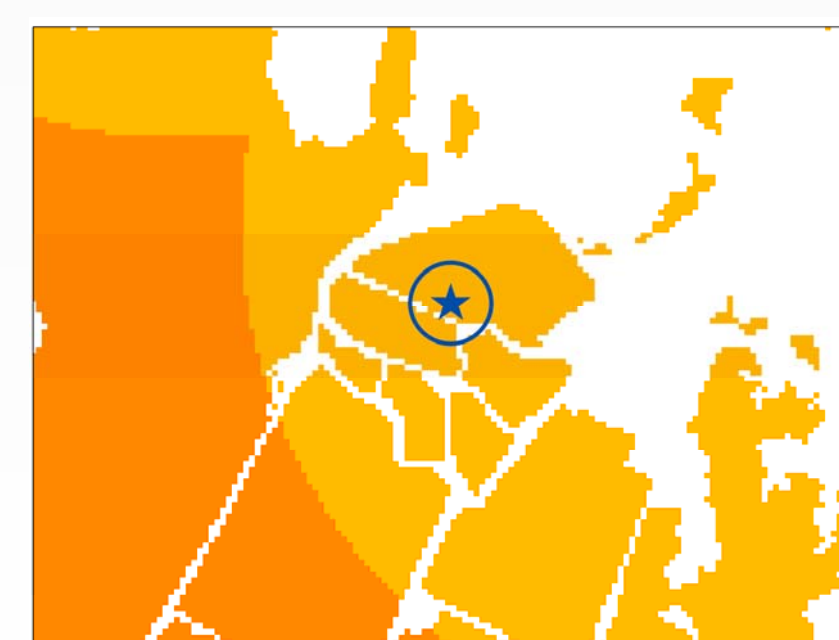
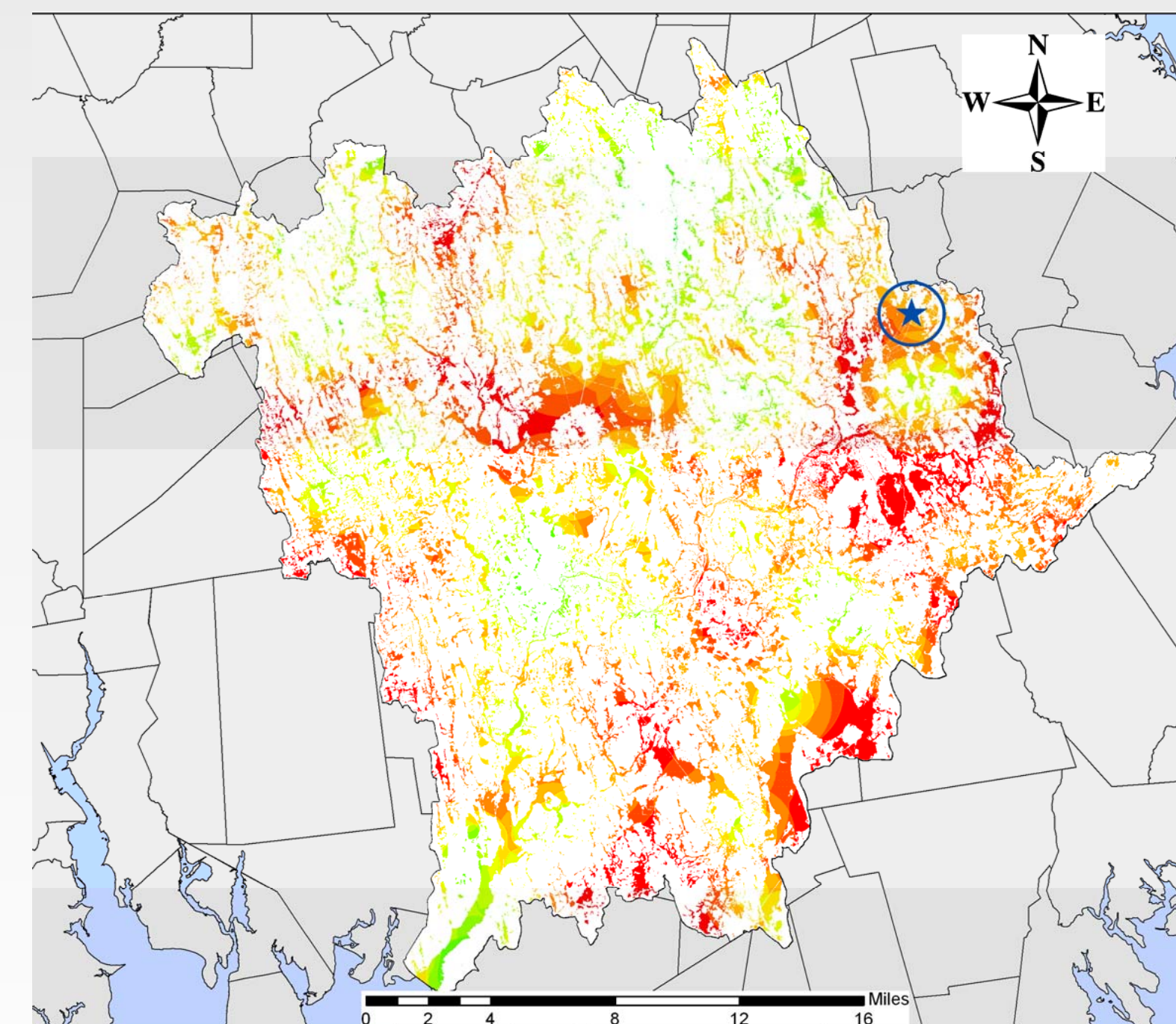
Results:

Based on the criteria for Scenario 1, the Bog 18 wetland mitigation site is located in an area with a rank equal to 6 (slightly less than moderately suitable for wetlands protection). There are other wetlands areas that are more suitable under this scenario.

Scenario 1: Preliminary site selection prior to inclusion of wetlands data



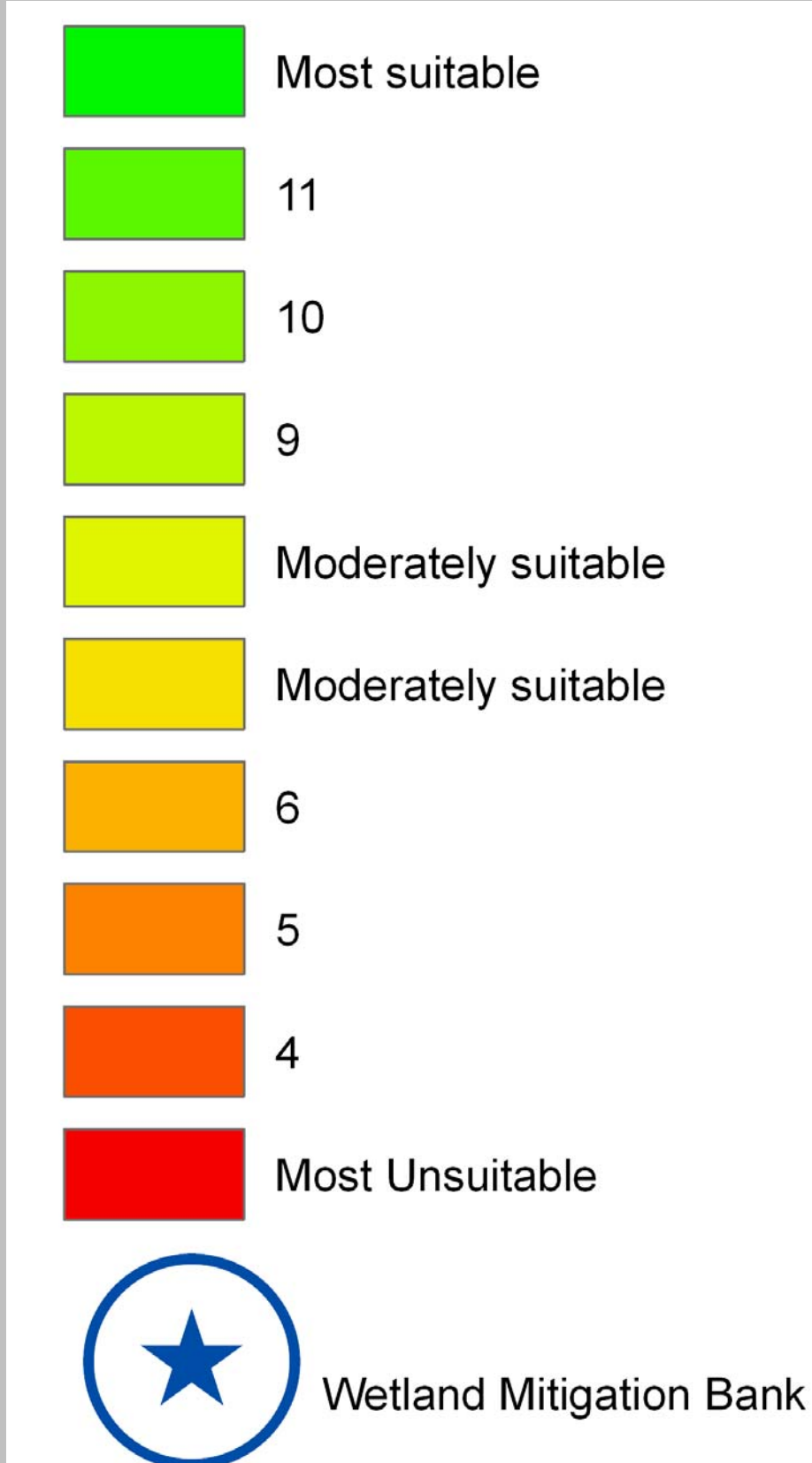
Scenario 1: Site selection with wetland areas showing through



Methods:

Data for the watershed was selected out from the larger MA layer and put into the same coordinate system. Area was recalculated in the attributes tables as necessary. The distance, density, and reclassify tools were used to create raster grids out of vector data and reclassify the data into a ranking system (four being the best, one being the worst). Raster grids were combined using the raster calculator to obtain an overall priority ranking. The same steps were completed for each scenario. The wetlands layer was converted to a raster grid so that those areas without wetlands could be isolated.

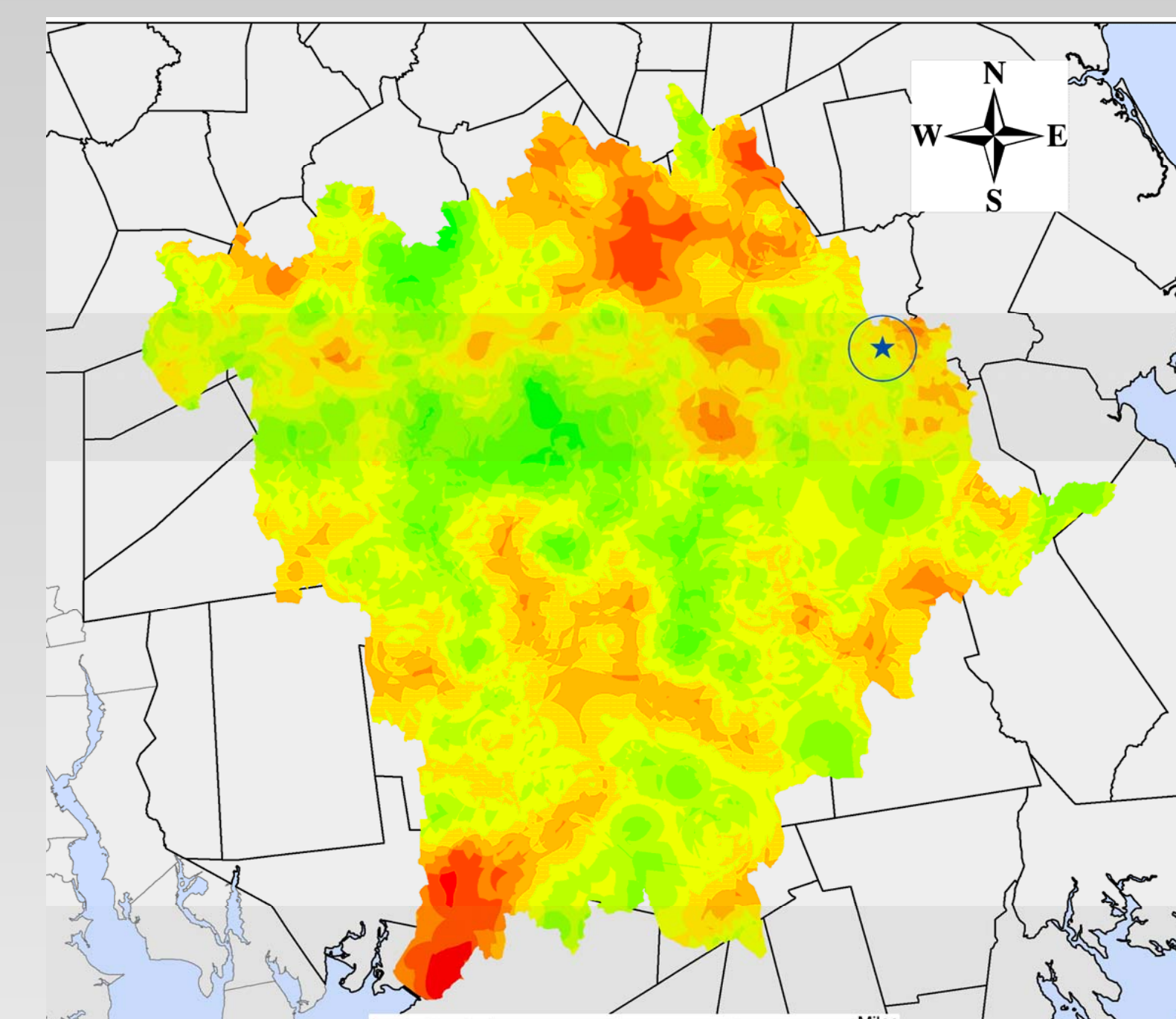
Siting for Wetlands Protection and Restoration



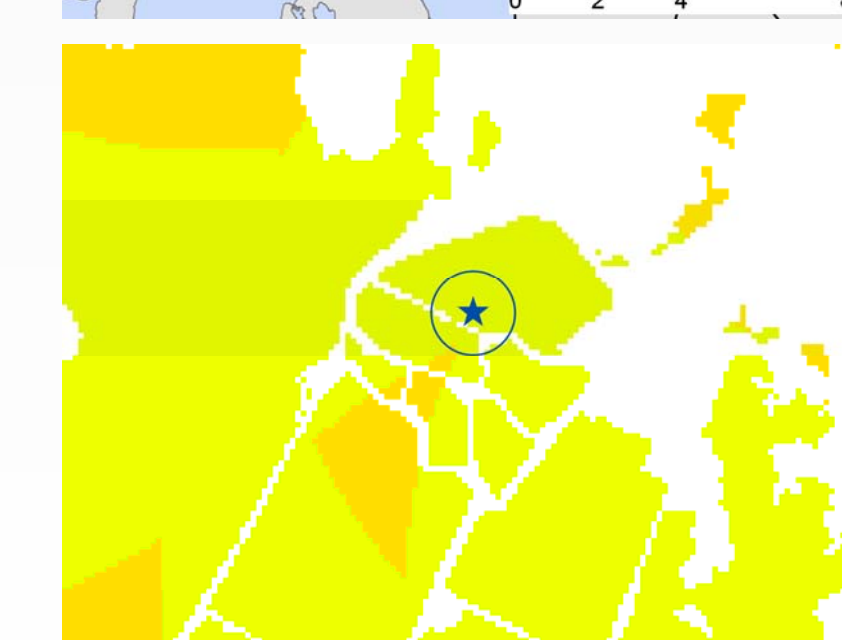
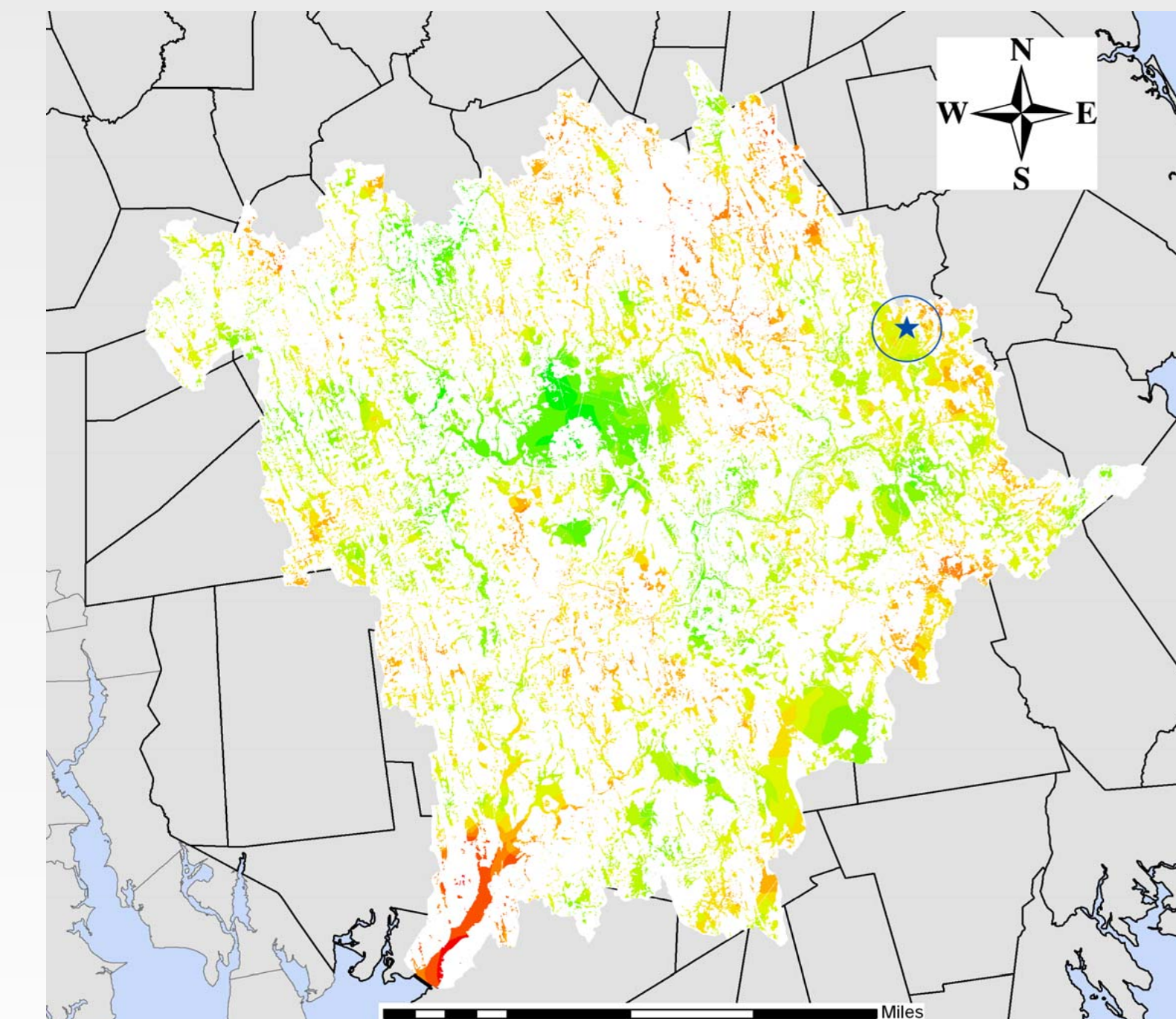
Limitations and further research needs:

Some limitations of this study include the lack of current land use data and an issue trying to use the impervious surface layer in the analysis (the conversion to vector data didn't work). This analysis could have also included demographic data to see if different wetlands protection scenarios benefit different groups of people based on income and race. It would also be beneficial to see what wetlands have already been permanently protected.

Scenario 2: Preliminary site selection prior to inclusion of wetlands data



Scenario 2: Site selection with wetland areas showing through



Scenario 2: Wetlands as Ecologically Sensitive Lands

This scenario places a high value on wetlands as ecologically sensitive lands for protection and includes those wetlands located near other ecologically sensitive areas, away from population density, and hazardous waste sites.

Results:

Based on the criteria for Scenario 2, the Bog 18 wetland mitigation site is located in an area moderately suitable for wetlands protection (rank equal to 8). There are some other wetlands areas that are more suitable for protection under this scenario although the ranking is higher here compared to Scenario 1.