

In the Nazareth Area, groundwater from public or private wells is the only source of drinking water for several of the Nazareth Area municipalities. These municipalities include Moore, Chapman and Bath. For the remaining municipalities, drinking water is also provided in varying degree by surface water sources from Easton Suburban Water Authority, the City of Bethlehem and Penn-American Water Company. It should be noted that Penn-American does also have groundwater well sources that may be serving some of these municipalities instead of surface water.

Groundwater quality can be impacted by a variety of potential pollution threats through over-application of fertilizers and pesticides, leaking underground storage tanks, malfunctioning septic systems or misuse or improper storage and disposal of hazardous chemicals, among others. Further, stormwater recharge can convey pollutants to groundwater if not treated first. Municipalities can protect public groundwater supply wells from pollution through the adoption of wellhead protection ordinances. East Allen and Moore townships were involved in a wellhead protection study during the 1990s to consider adoption of an ordinance that would protect two wells each. Detailed wellhead protection areas were prepared for each of the four wells with preliminary areas prepared for all wells in Lehigh and Northampton counties. A wellhead protection ordinance could regulate land use activities within the delineated recharge areas surrounding individual public water supply wells if adopted by the municipality(ies).

Goal

To preserve and protect the groundwater resources of the region.

Policies

- The quality and quantity of groundwater should be protected. Groundwater recharge should be encouraged to preserve the groundwater resource and stream baseflow.
- Local regulations should protect critical recharge areas surrounding existing and new public water supply wells, especially in the carbonate areas, through land use controls.
- Development that reduces the amount of impervious cover and infiltrates stormwater where possible should be promoted.

Implementation Strategies

- Municipalities will implement wellhead protection programs to protect public water supply wells.
- Municipalities will consider adoption of a water withdrawal ordinance to avoid overuse of groundwater.
- Municipalities will create a contaminant threat inventory to identify locations of potential threats to public water supplies.
- Municipalities will adopt and enforce stormwater quality control ordinances when completed by the county.

RESOURCE CONSERVATION VALUE

To summarize the natural resources discussed in this plan, an overall resource conservation value was created for the study area. Four natural resources were not included in the overall calculation. The Karst Features, Mineral Resources, and Groundwater data were omitted because these resources are addressed in other sections of the plan. The Riparian Buffer Assessment was omitted because this analysis indicates where a natural resource is lacking, not where the resource exists.

The Natural Lands Trust's (NLT) Interim Ecological Values Mapping Assessment data was used as a guide in determining value weights for the different natural resource features. As a starting point, each natural feature map (e.g. wetlands, floodplains) was compared to the NLT final conservation value ranking to establish the impact

of each feature on the final NLT rankings. The NLT assessment was also used to establish important thresholds within the data such as the relative value of woodlands *by size*. Final individual natural resource weights were assigned to ensure the resource was in the category thought to be appropriate if no other resource occurred at that location. For example, floodplains and wetlands should be in the High category, even if no other natural resource was present at that location, and were weighted as the minimum High value. The Significant Natural Areas data provided by The Nature Conservancy includes buffered areas for data security reasons. To compensate for the buffered area, the resource was weighted for the Medium level. This weighting allows the Natural Areas to be visible on the final mapping and adds value to other features located within their boundaries while not over-valuing the buffer areas. All weights were then calculated and the results were classified into four levels: Low (0 – 3), Medium (4 – 6), High (7 – 9), and Very High (10+).

From the analysis, the Very High Conservation Value areas are located on or at the base of the Blue Mountain, along the streams, and within the Natural Areas as mapped by The Nature Conservancy. The High Conservation Value areas also have this same type of pattern. The larger Medium Conservation Value areas are a result of the buffered Significant Natural Areas data or they represent areas of Capability Class I agricultural soils. The resource conservation value mapping was used as direct input to the Natural Resource Plan map as described below.

NATURAL RESOURCES PLAN

The final piece of this Natural Resources Plan is a map of recommended preservation areas and development restriction areas based on the plan's policies and the resource conservation value mapping. For each natural resource feature, such as steep slopes, floodplains, woodlands, etc., the plan identifies goals, policies and implementation strategies to preserve or protect the natural resource feature and/or guide development. An example is that all wetlands are recommended to be preserved including a 50 foot buffer surrounding the wetland. Another example is that carbonate bedrock areas may require certain development restrictions based on detailed site testing that identifies sinkholes or other karst features. Based on the plan's policies, the following areas are recommended to be preserved without development:

- Floodplains,
- Wetlands including a 50 foot buffer,
- Blue Mountain Natural Area,
- Slopes of greater than 25%,
- 1st, 2nd and 3rd order streams and waterbodies including a 50 foot buffer,
- 4th Order and Higher Streams including a 100 foot buffer,
- All Very High and High Resource Conservation Value areas as identified on Map 15,
- All riparian woodlands meaning woodlands within 100 feet of streams, and
- All woodlands that are within other significant natural areas.

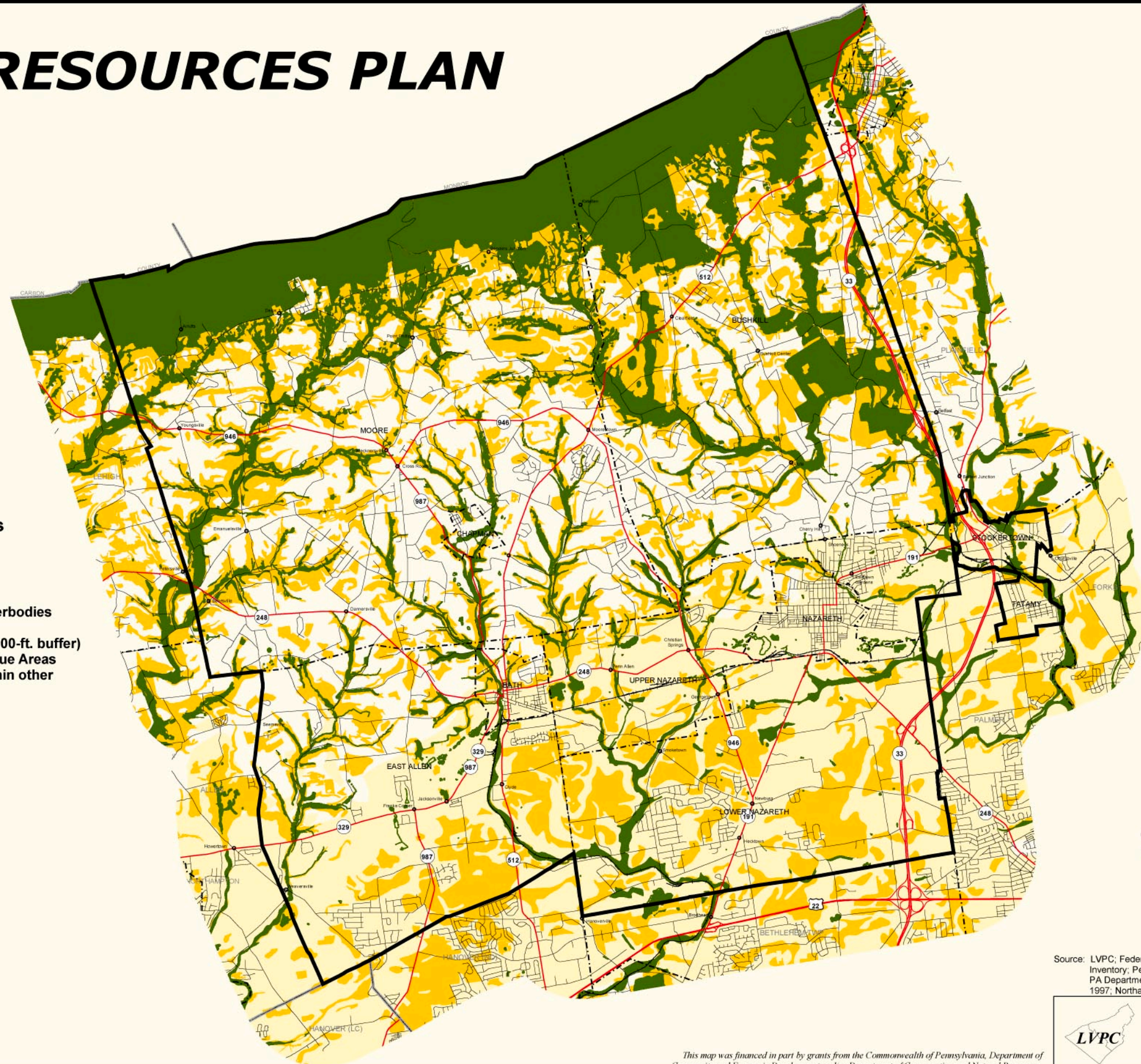
Based on the plan's policies, the following areas have restrictions on development:

- Potential hydric soils that should be evaluated for actual wetlands.
- Capability Class I soils that will be a factor in recommending farmland preservation areas within the overall Nazareth Area Comprehensive Plan.
- Slopes between 15% and 25% where lower density development and special erosion control measures are recommended.
- All remaining woodlands meaning those not recommended above for preservation. These woodlands are still important and tree removal should be minimized through the development process.
- All remaining significant natural areas meaning all except Blue Mountain already recommended for preservation. These natural areas are to be protected and/or preserved as opportunities arise.

- All carbonate bedrock areas for which a detailed site investigation is recommended to minimize any adverse consequences of sinkhole development.

Map 15 is the Natural Resources Plan for the Nazareth Area Comprehensive Plan showing recommended preservation areas and development restriction areas. Map 15 is a major building block of the Comprehensive Plan. Within the Plan, development will be steered away from the areas recommended for preservation. Areas recommended for farmland preservation will be added. Finally, the areas recommended for various types and densities of land development will be proposed based on avoiding the necessary preservation areas.

MAP 15 NATURAL RESOURCES PLAN



Recommended Preservation Areas

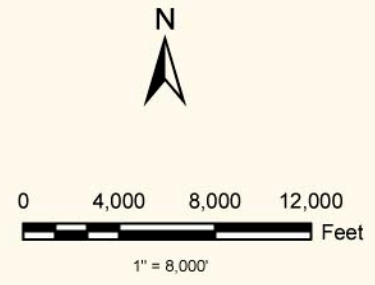
- Floodplains
- Wetlands (with 50-ft. buffer)
- Natural Areas (highest priority)
- Slopes (>25%)
- 1st, 2nd, 3rd Order Streams and Waterbodies (with 50-ft. buffer)
- 4th Order and Higher Streams (with 100-ft. buffer)
- Very High and High Conservation Value Areas
- Woodlands (riparian [100 ft.] and within other natural areas)

Development Restriction Areas

- Potential Hydric Soils
- Capability Class 1 Soils
- Slopes (15-25%)
- Remaining Woodlands
- Remaining Natural Areas

- Carbonate Bedrock

- Study Area Boundary
- Municipal Boundaries
- County Boundaries
- Major Roads
- Minor Roads
- + Active Railroads



Source: LVPC; Federal Emergency Management Agency, 2001; National Wetland Inventory; Pennsylvania Science Office of The Nature Conservancy, 1999; PA Department of Conservation and Natural Resources; USDA-SCS, 1997; Northampton County Dept. of Fiscal Affairs, GIS Division, 2000



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