



# Environmental Conservation



Native plants near the Monocacy Creek



## ■ Environmental Conservation Vision

While most of Bethlehem is highly developed, the City has important environmental features worthy of conservation. Flood-prone areas should remain undeveloped. Natural areas along creeks are important to maintaining water quality suitable for trout. Thick vegetation along waterways helps to filter impurities before they enter the waterways. Creek corridors also provide natural habitat and offer opportunities for fishing and scenic recreation trails.

Bethlehem's wooded areas stabilize soil and prevent erosion. Trees reduce, slow, and absorb stormwater runoff. Tree canopies provide shade and are scenic. Trees improve air quality by transforming carbon dioxide into oxygen.

Moderately steep slopes (areas of 15% to 25% grade) and very steep slopes (areas with a grade over 25%) need to be protected. Removing too much vegetation from steep slopes and over-developing hillside areas can cause erosion, accelerate stormwater runoff, and degrade scenic views.

In addition to preserving important environmental areas, Bethlehem is very aware of the need to advance energy conservation, encourage eco-friendly design practices, and promote greening of the City's built environment.

Bethlehem's goals for conserving the natural environment include:

- Ensure the City's development regulations adequately protect sensitive natural features, such as waterway corridors, woodlands, and steep slopes.
- Acquire or otherwise permanently preserve more high-value open space land - properties with sizeable woodlands, properties alongside waterways, properties that offer particularly scenic views, or properties with other special ecological features.
- Encourage developers to preserve key areas in open space, enhance landscaping and use green technology in site design and building construction.
- Set an example by using green technology in operating and maintaining City-owned property.



A cluster of trees along the Lehigh River



## ■ Environmental Overview

Bethlehem is in the Lehigh River watershed, which means all areas of the City eventually drain to the Lehigh River. Some areas of the City drain directly into the Lehigh River, while other areas first drain into Monocacy Creek or Saucon Creek.

The Monocacy Creek originates in the Slate Belt north of the City. From these headwaters, it follows a 20-mile course to its confluence with the Lehigh River in Bethlehem. The State has designated Monocacy Creek as a Class A wild trout stream, which is rare inside an urbanized area.

Several small tributaries that begin in areas of Bethlehem drain into the Saucon Creek, before that waterway reaches Bethlehem near Friedensville Road. Fawn Run Creek, which flows through Bethlehem Steel land now owned by LVIP, is one example. The Saucon Creek flows through Saucon Park and into the Lehigh River south of Freemansburg. The main stem of the Saucon Creek is joined by the East Branch of the Saucon Creek, which flows through former Bethlehem Steel lands east of Route 412. Saucon Creek is 27 miles long and is considered a High Quality Coldwater Fishery by the Pennsylvania Department of Environmental Protection.



Monocacy Creek is a Class A wild trout stream

■ Saucon Creek and Monocacy Creek have each been the subject of recent studies concerning flooding problems, stream buffering, and stream bank restoration, among other activities. In each case, progress has been made on implementing recommended improvements. However, both stream corridors need more improvements.

The most prominent topographic feature in Bethlehem is the South Mountain, which rises 700 feet above the Lehigh River. Major parts of the South Side are situated around this mountain's base and on its northern face. Most undeveloped wooded land on the South Mountain is owned by Lehigh University.

On the City's North Side, land rises from the banks of the Lehigh to an elevation of about 100 feet and then plateaus. Most other steep locations on the North Side are clustered along the banks of Monocacy Creek. The scenic Camels Hump area includes wooded steep slopes near the point where Monocacy Creek enters

the City adjacent to Santee Mill Road. Most woodlands in the City exist on steeply sloped lands that were left undeveloped in the past because of the high costs of construction on those areas. Most wetlands in the City are concentrated along the Monocacy and Saucon Creeks.

Bethlehem has taken several steps to reduce energy usage in City government operations and address the other aspects of this Climate Protection Agreement, to which the City is a party. In a related development, the City established the City of Bethlehem Environmental Advisory Council in 2007 to provide guidance to City government on a range of environmental issues such as the following, among others:

- Ways to encourage sustainable design.
- Use of renewable energy sources.
- Protection of natural resources and open space.

Bethlehem's re-established its City Forester staff position in 2008. Examples of the City Forester's duties and responsibilities include:

- Supervising the planting and pruning of all street trees and park trees.
- Overseeing compliance with the City's Shade Tree Ordinance.
- Reviewing development plans to ensure compliance with the City's Subdivision and Land Development Ordinance.

The City is also investigating how best to encourage buildings that are environmentally-friendly, healthy for their occupants, and energy-efficient. Noteworthy examples of "green design" are officially recognized through the national LEED (Leadership in Energy and Environmental Design) program and similar initiatives. To achieve certification, projects must be evaluated on compliance with green building criteria in the following areas, among others:

- Construction materials
- Energy efficient building systems
- Water usage
- Landscaping and hardscaping
- Stormwater management



A variety of different tree species can be found throughout Bethlehem



An abandoned railroad along the Lehigh Canal has potential as a recreation trail

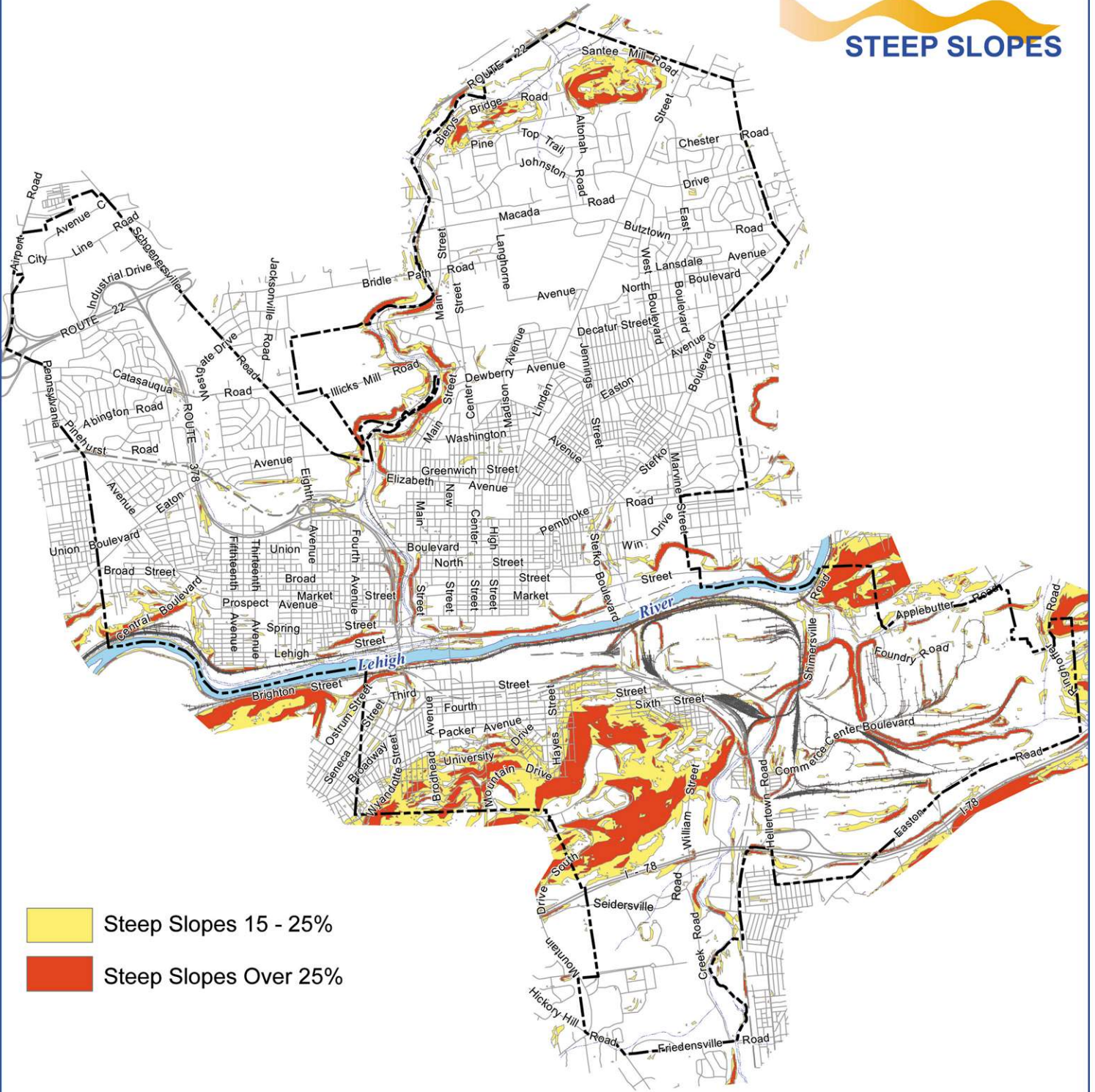
## ■ Environmental Conservation Strategies

Bethlehem should pursue the following strategies to help protect the City's natural environment.

- 1.** Seek State grants, potential Federal Highlands funding, and other funding to acquire conservation easements or full title to pre-designated, high-value open spaces, such as:
  - Sites identified in the Lehigh Valley Planning Commission's 2006 Natural Resource Plan.
  - Other sensitive areas, such as creeks, floodprone locations, woodlands, and steep slopes.
- 2.** Use Official Map powers to help preserve trail corridors and other open spaces. Pennsylvania permits a municipality to adopt an Official Map that identifies future roads, parks, and trails. Municipalities then have up to one year to acquire or refuse if a sale or development is proposed that affects that site.
- 3.** Work closely with the watershed associations, conservancies, local educational institutions and landowners to preserve and plant vegetation along creek corridors and to help retain the predominantly wooded appearance of South Mountain.
- 4.** Take the following steps aimed at greening the City:
  - Update the City Shade Tree Ordinance to promote native species.
  - Strengthen landscaping requirements for new development.
  - Fully enforce City regulations that require property owners to replace damaged or dead street trees.
- 5.** Update City zoning regulations to:
  - Strengthen open space and landscaping requirements for new development.
  - Prohibit new buildings in the 100-year floodplain, except for areas already developed.



STEEP SLOPES



Steep Slopes 15 - 25%
Steep Slopes Over 25%



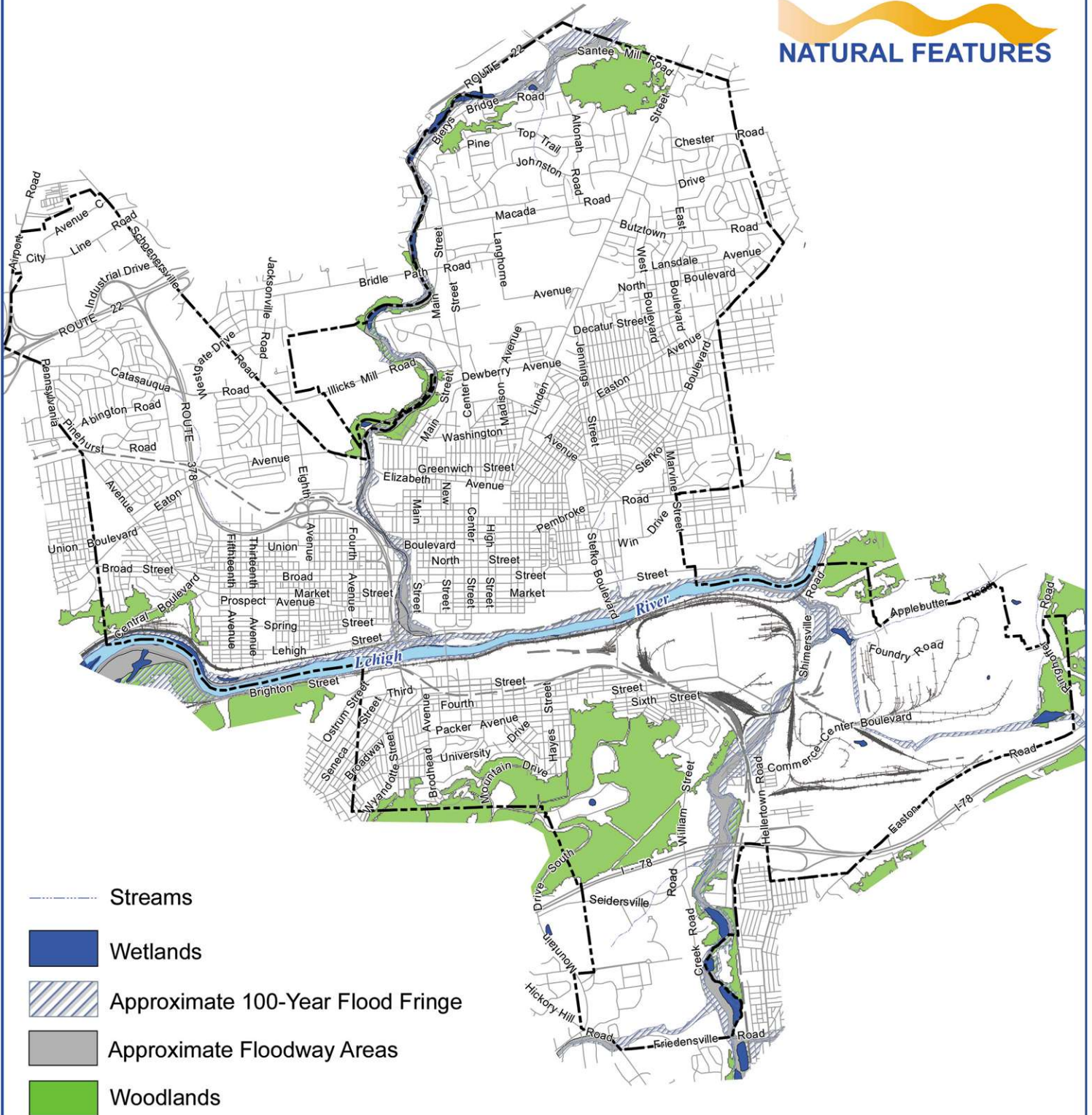
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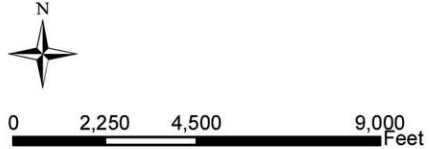




**NATURAL FEATURES**



- Streams
- Wetlands
- Approximate 100-Year Flood Fringe
- Approximate Floodway Areas
- Woodlands





- 6.** Join with neighboring municipalities to investigate solutions that would reduce flooding along the Monocacy Creek, particularly in Bethlehem's Colonial Industrial Quarter.
- 7.** Continue to research and pursue major sources of grants for energy efficiency improvements, new street lights, new traffic signals, and the purchase of hybrid, alternative fuel or electric vehicles. The Federal Energy and Environmental Block Grant program is one example.
- 8.** Continue working with the Monocacy Creek Watershed Association and others to complete more improvements at Monocacy Park that will:
  - Establish additional vegetative buffers along the Monocacy Creek.
  - Realign and widen parts of the Monocacy Creek to reduce the speed and intensity of the creek's flood waters.
  - Create new wetlands to help absorb flood waters and provide more habitat for native flora and fauna.
  - Establish Monocacy Creek park as an environmental education center and outdoor classroom with the historic Illick's Mill building as the center for these activities.
- 9.** Work with the Bethlehem Environmental Advisory Council on resource conservation and related initiatives. The Mayors' Climate Protection Agreement provides a good overview on the City's overall goals for improving the local environment.
- 10.** Consider zoning or other ordinance amendments that encourage energy efficiency or new eco-friendly technologies as they become available. Exempting solar panels and skylights from the City's maximum height limits is one example.
- 11.** Research the possibility of offering incentives for buildings or site designs that receive official "green building" certification.
- 12.** Encourage the use of native plants where possible and practical on City property and within new land developments.



Flowering trees along Center Street

