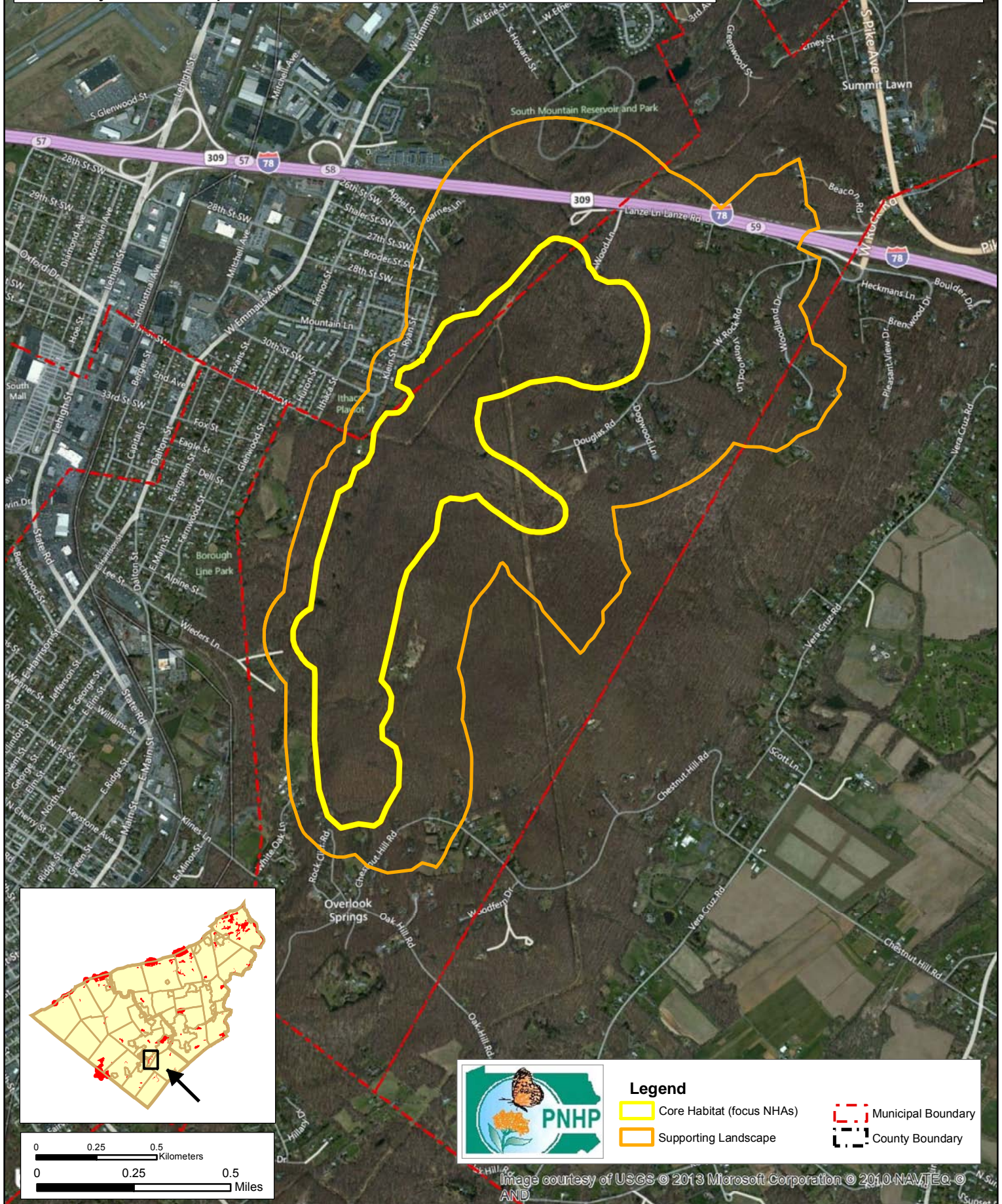


Robert Rodale Reserve NHA

Natural Heritage Inventory of Lehigh and Northampton Counties,
Pennsylvania – Update 2013






Legend

- Core Habitat (focus NHAs)
- Supporting Landscape

- Municipal Boundary
- County Boundary

Robert Rodale Reserve NHA – State Significance

Species and natural communities of concern that can be found in this NHA include the following:

Species or Natural Community Name:	Taxa	PNHP Rank ¹		PA Legal Status ¹ (Proposed)	Last Seen	Quality ²
		Global	State			
Skunk cabbage - golden saxifrage forest seep	C	GNR	S4S5	N	2006	BC
Western Hairy Rock-cress (<i>Arabis hirsuta</i>)		G5	S1	TU (PE)	2011	CD
Screw-stem (<i>Bartonia paniculata</i>)		G5	S3	N (PR)	2012	AC
Lettuceleaf Saxifrage (<i>Saxifraga micranthidifolia</i>)		G5	S4	TU (SP)	2012	BC
Sensitive Species of Concern ³	S	---	---	---	2012	AC



(Element type: Communities, Sensitive Species, Mammals, Birds, Fish, Amphibians, Mussels, Odonates, Lepidopterans, Plants)

¹See the PNHP website (<http://www.naturalheritage.state.pa.us/RankStatusDef.aspx>) for an explanation of PNHP ranks and legal status. A legal status in parentheses is a status change recommended by the Pennsylvania Biological Survey.

²See NatureServe website (<http://www.natureserve.org/explorer/eorankguide.htm>) for an explanation of quality ranks.

³This species is not named by request of the jurisdictional agency responsible for its protection.

Location: This Natural Heritage Area lies on the southeastern outskirts of the City of Allentown on the south facing forested slope of South Mountain and is roughly bounded by Interstate 78 on the north, and the crest of South Mountain on the southeast.

o Municipalities:

o Lehigh County: City of Allentown, Salisbury Township

o USGS Quadrangles: Allentown East

o Watersheds (HUC 12): Little Lehigh Creek

o 1999 Lehigh & Northampton Natural Areas Inventory reference: Includes all or a portion of “Robert Rodale Reserve”

o 2005 Lehigh & Northampton Natural Areas Inventory Update reference: Includes all or a portion of “Robert Rodale Reserve”

Description: The forested slopes of South Mountain separate the densely urban areas of Allentown from the more sparsely populated rural and suburban areas to the south. The forested landscape contains scattered bedrock outcrops, and seeps. Several water-filled excavation pits occur along the base of the mountain, mimicking the function of naturally occurring vernal pools. The forested hill also contain almost 500 acres of interior forest, which is forest that is at least 100 meters from the edge of any opening such as a building, field, road, railroad or utility rights-of-way. The area between the forest edge and 100 meters into the forest is considered highly influenced by edge effects, such as increased levels of light, noise, temperature, wind and dryness which create much different habitat conditions than those found in interior forest conditions. Interior forest conditions are essential habitat for interior forest dwelling birds such as Scarlet Tanagers, Worm-eating Warblers, and Ovenbirds. Much of the forested habitat on South Mountain is conserved by the Wildlands Conservancy and the City of Allentown.

Element of Concern Considerations:

- Skunk cabbage - golden saxifrage forest seeps are where groundwater meets the surface and diffuses through the soil to form a wide, shallow area of muck soil, often dominated by skunk cabbage. Typically the community is over-topped by trees and shrubs from the surrounding forest, although large examples will be open. Herbaceous species are strongly dominant and tend to be relatively diverse, especially where there is greater mineral enrichment. Bedrock disruptions such as drilling or mining in nearby areas can contaminate or alter the flow patterns of the groundwater that feeds the seepage (McPherson, 2011).
- Western hairy rockcress in Pennsylvania typically occurs on dry cliffs, and rocky ledges, usually on limestone substrates. Control of invasive species of plants, maintenance of open habitats and protection of rocky outcrops can help conserve populations of this species.
- Screw-stem is a small, easily overlooked plant of moist habitats. Avoid forest fragmentation and disruption of site hydrology to help conserve populations of this species.
- Lettuceleaf Saxifrage is a plant of shaded seeps, springs and small streams. Avoid forest fragmentation and disruption of site hydrology to help conserve populations of this species.
- The sensitive species of concern, which is not named at the request of the jurisdictional agency overseeing its protection, uses the forested areas as its primary habitat. Fragmentation of the forest canopy could decrease the suitable habitat available to this species at this location. These woodlands may be detrimentally altered by encroachment of invasive species, over-browsing by deer, and fragmentation. Fragmentation can have a drying effect on the habitat and promote invasive species growth. Creating buffers around fragmented habitat and removal of invasive species will help to maintain populations and encourage new population growth.

Habitat Disturbances:

- Historic –
 - Aerial photos from 1939 (<http://www.pennpilot.psu.edu/>) show that most of this hill was forested then and remains so today. Though the forest was likely cut for lumber and fuel several times since colonial days, much of the forest has been standing for over 100 years. The forest likely contains individual trees that are much older.
 - Portions of the north facing toe slope of South Mountain were cleared for agricultural production prior to 1939.
 - A utility ROW was cut through the northern portion of this Natural Heritage Area sometime before 1939.
- Current –
 - Rural and suburban development has encroached on the forested hill, reducing the amount of interior forest with each additional house and access road.
 - A new utility ROW created an additional fragmenting feature, dividing the large contiguous interior forest into two smaller patches of interior forest. The opening created by the utility ROW, and its continued maintenance, helps to provide the open canopy conditions preferred by the western hairy rockcress.
 - Invasive species of plants are well established along the roads and utility ROWs and have begun to colonize the forest interior in some locations.
 - Over browsing by white-tailed deer is a serious threat to the overall understory plant diversity. An overabundance of deer can create the effect of park-like forests in which the understory and vertical stratification is greatly reduced. Removal of understory species eliminates habitat for some nesting songbirds as well as increases competition between deer and other wildlife due to reduced food sources. Deer have strong, species-specific feeding preferences. The most highly preferred species are the first to decline or disappear when deer numbers are high. Furthermore, deer have been shown to be prolific seed dispersers for many of the most invasive non-native species. The result is greatly impoverished native species diversity, failure of native tree regeneration, and the rapid proliferation of invasive species. It is likely their selective feeding habits and effective seed dispersal make the spread of invasive plants much faster than would be the case without deer, even where herds are only moderately oversized.

Conservation Actions:

- Preserve and restore the natural ground water and surface water hydrology. Drilling, mining, or other disruptions to bedrock should not be undertaken within a half mile of a seepage wetland without a thorough understanding of bedrock layers and groundwater flows. Groundwater flow patterns do not always mirror surface watersheds, and in some cases aquifers may be contiguous over large areas (McPherson, 2011).
- Allow the forested habitats to achieve and maintain old growth conditions. Avoid fragmenting the existing forested areas with additional buildings or infrastructure. Avoid logging in this area except as it relates to invasive species removal.
- Maintain open habitats along utility ROWs. The population of western hairy rockcress occurs along a portion of the utility ROW where erosion has exposed bare soil and competition has been kept in check by ROW maintenance. Create “no spray” zones along the most sensitive areas of the rights-of-way to avoid unintentional destruction of the species of concern or its habitat. Indiscriminate use of herbicides as rights-of-way defoliants is not appropriate. A smarter, more selective use of vegetation controls is required in these areas that contain both invasive species and species of concern.
- Control invasive species to prevent native species from being crowded out by introduced species. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try and repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will be necessary.
- Reduce the deer density in the area. Uncommon species of native plants are particularly susceptible to deer herbivory.



Rocky Gleason, (PNHP)

Lettuceleaf saxifrage grows in seeps draining off of South Mountain slopes.

References:

- McPherson, J. 2011. Pennsylvania Natural Heritage Program. Skunk-cabbage – Golden Saxifrage Seep Factsheet. Available from: <http://www.naturalheritage.state.pa.us/Community.aspx?=-16013>. Date Accessed: May 01, 2013
- NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://www.natureserve.org/explorer>.
- Pennsylvania Natural Heritage Program. 2013.
- Rhoads, A. F. and W. M. Klein, Jr. 1993. The Vascular Flora of Pennsylvania: Annotated Checklist and Atlas. American Philosophical Society, Philadelphia.
- Rhoads, A. F. and T. A. Block. 2007. The Plants of Pennsylvania: An Illustrated Manual, Second Edition. University of Pennsylvania Press, Philadelphia.