



Statewide County Natural Heritage Inventory Map A Tool for Community Planning

Overview

The County Natural Heritage Inventory effort within the state is another of the cooperative programs undertaken by the Pennsylvania Natural Heritage Program (PNHP) partnership. The County Natural Heritage Inventories (CNHI) have been systematic studies of the critical biological resources of the state, county by county. The primary focus of CNHIs has been on species of concern: those plants, animals, natural communities, and habitats most at risk of extinction at the global or local level. These projects are designed to identify, map and discuss areas that support species of concern, exemplary natural communities and broad expanses of intact natural ecosystems that support components of Pennsylvania's native species biodiversity. These areas are prioritized based upon their ecological qualities and provided with recommendations regarding their management and protection.

These studies were conceived as tools to assist in planning to avoid the accidental destruction of habitats supporting species of concern at both the county and municipal levels and have been used effectively in that capacity. CNHIs have been incorporated into comprehensive plans, consulted to plan development projects, and utilized by conservation organizations to prioritize their work. Additionally, these studies have been used to help in the development of recreational amenities, promotion of tourism industries and assistance in community development. CNHIs have also been a primary source for much of the Pennsylvania Natural Diversity Inventory (PNDI) permit review data. CNHIs can actually streamline economic and infrastructure developments by providing information on sensitive environmental features early in the planning process when adjustments can be made at little cost or delay.

Natural Heritage Inventories and Environmental Review

The results presented in this map represent a snapshot in time, highlighting the sensitive natural areas within Pennsylvania. The existing polygons in this layer were created for specific County Natural Heritage Inventory projects over a 20 year period. Hence, many of the existing polygons represent data that was collected 10-20 years ago. Updating this information is an ongoing process and goal of the Heritage Program. The sites in the Statewide County Natural Heritage Inventory have been identified to help guide wise land use and county planning. The County Natural Heritage Inventory is a planning tool, and is not intended to be used as a substitute for environmental review, since information is constantly being updated as natural resources are both discovered and lost due to development as well as natural processes. Planning Commissions and applicants for building permits should conduct free, online, environmental reviews to inform them of project-specific potential conflicts with sensitive natural resources. Environmental reviews can be conducted by visiting the [PNDI website](#). If conflicts are noted during the environmental review process, the applicant is informed of the steps to take to minimize negative effects on sensitive natural resources.



Plants & Natural Communities



Small Mammals



Invertebrates



Reptiles & Amphibians

Methods

County Natural Heritage Inventories proceed in three stages: 1) site selection based on existing data, map and aerial photo interpretation, recommendations from local experts and aerial reconnaissance; 2) ground surveys; and 3) data analysis and mapping.

Site Selection

Inventory site selection is guided by information from a variety of sources. A review of the Pennsylvania Natural Heritage Program database determined what locations were previously known for species of concern and important natural communities within a county. Local citizens knowledgeable about the flora and fauna of the area were contacted for site suggestions. Individuals from academic institutions and state and federal agencies that steward natural resources (e.g. Pennsylvania Game Commission, Pennsylvania Bureau of Forestry, Carnegie Museum of Natural History, Morris Arboretum, Academy of Natural Science) were also contacted to obtain information about lands or resources they manage. General information from other sources such as soil maps, wetland maps, geologic maps, earlier field studies, and published materials on the natural history of the area helps to provide a better understanding of the area's natural environment.

Aerial photographs were reviewed to identify sites for ground survey. Once preliminary site selection was completed, a reconnaissance flight over chosen areas of the county was undertaken. Information concerning extent, quality, and context within the landscape can be gathered easily from the air. Based on aerial photo interpretation and aerial surveys, some sites were eliminated from consideration if they proved to be highly disturbed, fragmented, or lacked the targeted natural feature.

Ground Surveys

Areas identified as inventory sites were scheduled for ground surveys. After obtaining permission from private landowners, sites were examined to evaluate the condition and quality of the habitat and to classify the natural communities present. Field survey forms were completed for each site. The flora, fauna, level of disturbance, approximate age of forest community and local threats were among the most important data recorded for each site. In cases where landowner permission for site visits could not be obtained or enough existing information was available from other sources, sites were not ground surveyed.

Data Analysis and Mapping

Data on species of concern and natural communities obtained during the field work for this inventory were combined with existing data and summarized. All sites with rare species and/or exemplary natural communities were selected for inclusion in CNHI sites. Boundaries defining "Core Habitat" and "Supporting Landscape" for each site were delineated using general habitat guidelines for the elements of concern. These guidelines are based on scientific literature and professional judgment for individual species or animal assemblages and may incorporate physical factors (e.g., slope, aspect, hydrology); ecological factors (e.g. species composition, disturbance regime); or input provided by jurisdictional government agencies. Boundaries tend to vary in size and extent depending on the physical characteristics of a given site and the ecological requirements of its unique natural elements. For instance, two wetlands of exactly the same size occurring in the same region may require very different areas to support their functions if one receives mostly ground water and the other receives mostly surface water. The CNHI sites were then assigned a significance rank based on their importance to the biological diversity and ecological integrity of the county. These ranks can be used to help prioritize future conservation efforts.

Combining Existing CNHI Data

The existing CNHI sites were created for specific CNHI projects over 20 years by different personnel and an evolving methodology. Since the scope of individual projects was limited to a particular county, CNHI sites were developed for the county at the county level. As such, they were not intended to be viewed outside of the context of the individual CNHI report. CNHI sites depicting sensitive natural features often stopped near the edge of county boundaries even though the natural resource continued into the next county. Individual CNHI projects contained much conflicting information especially at the edges of the counties where the CNHI sites developed for one county did not match the CNHI sites depicted in the adjacent counties.

The areas highlighted in the CNHIs representing sensitive natural features within each county have been merged into a single layer to provide a seamless statewide coverage. Until now, one would have to sift through the various CNHI projects to get a preview of the primary locations for species of concern and other sensitive natural features prior to submitting a project for environmental review. This statewide layer of existing CNHI sites allows for a landscape level review of the sensitive ecological features of the state.

In addition, the individual CNHIs were static, representing conditions as they were at the time the project was completed. Since species of concern and their habitat locations are periodically resurveyed and updated and new information added and modified, this information is in constant fluctuation. This statewide CNHI map is more dynamic, and will be updated frequently to reflect changing conditions and knowledge.

Currently, four levels of CNHI sites are used to highlight the sensitive ecological attributes of the landscape:

- *Core Habitat* refers to areas containing plant or animal species of concern at the state or federal levels, exemplary natural communities, or exceptional native diversity. Core habitats delineate essential habitat that cannot absorb significant levels of activity without substantial impact to the elements of concern.
- *Supporting Landscape* refers to areas surrounding or contiguous to core habitats that maintain vital ecological processes or secondary habitat for sensitive natural features that may be able to accommodate some types of low-impact activities.
- *Landscape Conservation Area* refers to large contiguous areas that are important because of their size, open space, habitats and/or inclusion of one or more core habitats for species of concern. These large regions in relatively natural condition can be viewed as regional assets; they improve quality of life by providing a landscape imbued with a sense of beauty and wilderness, they provide a sustainable economic base, and their high ecological integrity offers unique capacity to support biodiversity and human health. Whole suites of species as well as general ecological and environmental processes can be offered protection by focusing conservation efforts on large expanses of quality habitats of all types. Planning and stewardship efforts can preserve these functions of the landscape by limiting the overall amount of land converted to other uses, thereby minimizing fragmentation of these areas.

A note about sensitive species

Several species of plants and animals are considered “sensitive species” by the jurisdictional agency overseeing their protection (see below). Reasons for sensitive species status include extreme rarity, collection for the pet or nursery trade, disturbance due to public observation, or deliberate poaching and killing. Therefore, these species are referred to simply as ‘species of concern’ or ‘sensitive species of concern’. In certain cases, some species (e.g. timber rattlesnakes, bald eagles) are not mapped due to large home ranges and high sensitivity to disturbance.

Plants, terrestrial invertebrates, and natural communities are under the jurisdiction of the PA Department of Conservation and Natural Resources (DCNR); mammals and birds are under the jurisdiction of the PA Game Commission (PGC); aquatic animals, reptiles, and amphibians are under the jurisdiction of the PA Fish and Boat Commission (PFBC); plants and animals designated as Federally protected are under the jurisdiction of the US Fish & Wildlife Service (USFWS).

While this project does join the existing CNHI data together into a single GIS layer, for the most part, it reflects species of concern information at the time it was first mapped and in most cases does not reflect data obtained from subsequent surveys. Newer surveys have documented species of concern and other sensitive natural features that are not included in the original CNHIs.

- *Provisional species of concern site* refers to one or more species occurrences documented outside of existing core habitat areas. These areas are in the process of being evaluated and drawn based on species habitat requirements.

Site Priority Ranking

Since this Statewide CNHI layer represents areas delineated for the CNHI projects over a 20+ year span, not all sites are depicted with this three level approach. As this project progresses, existing site boundaries will be replaced by those developed with a standardized methodology.

The conservation significance ranking system for this current polygon layer reflects the ranks assigned for the original CNHI or its neighboring counties and do not represent a statewide rank. The existing significance ranks were intended to rank sites within a county, not between counties. A site ranked highly in a county of few species of concern would likely not have been ranked highly in a county with a large quantity of species of concern. A statewide metric will be developed and used to rank the CNHI polygons across the state to allow for statewide analysis of this data.