

# Long-term Economic Monitoring Program

The goal of the Long-term Economic Monitoring Program is to continually evaluate the economic health of the Pinelands region in an objective and reliable way. This goal is achieved by looking at key segments of the region's economy as well as any additional variables that might be identified. The variables are used to compare one region to another over time.

**Core Variables:** Four primary types of variables are monitored: population, real estate, economic and municipal finance. In all, 21 variables are monitored, with supplemental variables occasionally included.

**Geographic Extent:** A total of 53 municipalities have all or part of their land in the Pinelands Area, the region where the Pinelands Commission oversees land use and development. For the Economic Monitoring Program, a municipality is considered a Pinelands municipality if at least 10% of its land falls within the Pinelands Area. This rule is a result of some data only being available at a municipal level and not at a smaller scale. Of the 53 municipalities that fall within the Pinelands Area, 47 are considered to be Pinelands municipalities, and are located in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Ocean counties. The remaining 155 municipalities in southern New Jersey are considered to be the Non-Pinelands municipalities.

In recent years, the Commission has focused on improving the quality of data for municipalities that are split by the Pinelands Area boundary by acquiring sub-municipal data. The sub-municipal data are better suited for revealing trends within the Pinelands boundary because the Non-Pinelands portions of a municipality are excluded.

**Municipal Fact Book:** Since 2002, the Annual Long-term Economic Monitoring Report has included a Municipal Fact Book section that displays a one-page summary of information for each municipality that has land inside the Pinelands Area. Each page includes a map and a table that summarizes select economic variables and how that municipality compares to the rest of southern New Jersey.

**Special Studies:** As part of the Economic Monitoring Program, the Commission has undertaken a series of special studies that delve further into various aspects of the Pinelands economy. Examples of past studies include an investigation into blueberry products, an update of housing demand in the Pinelands, and an

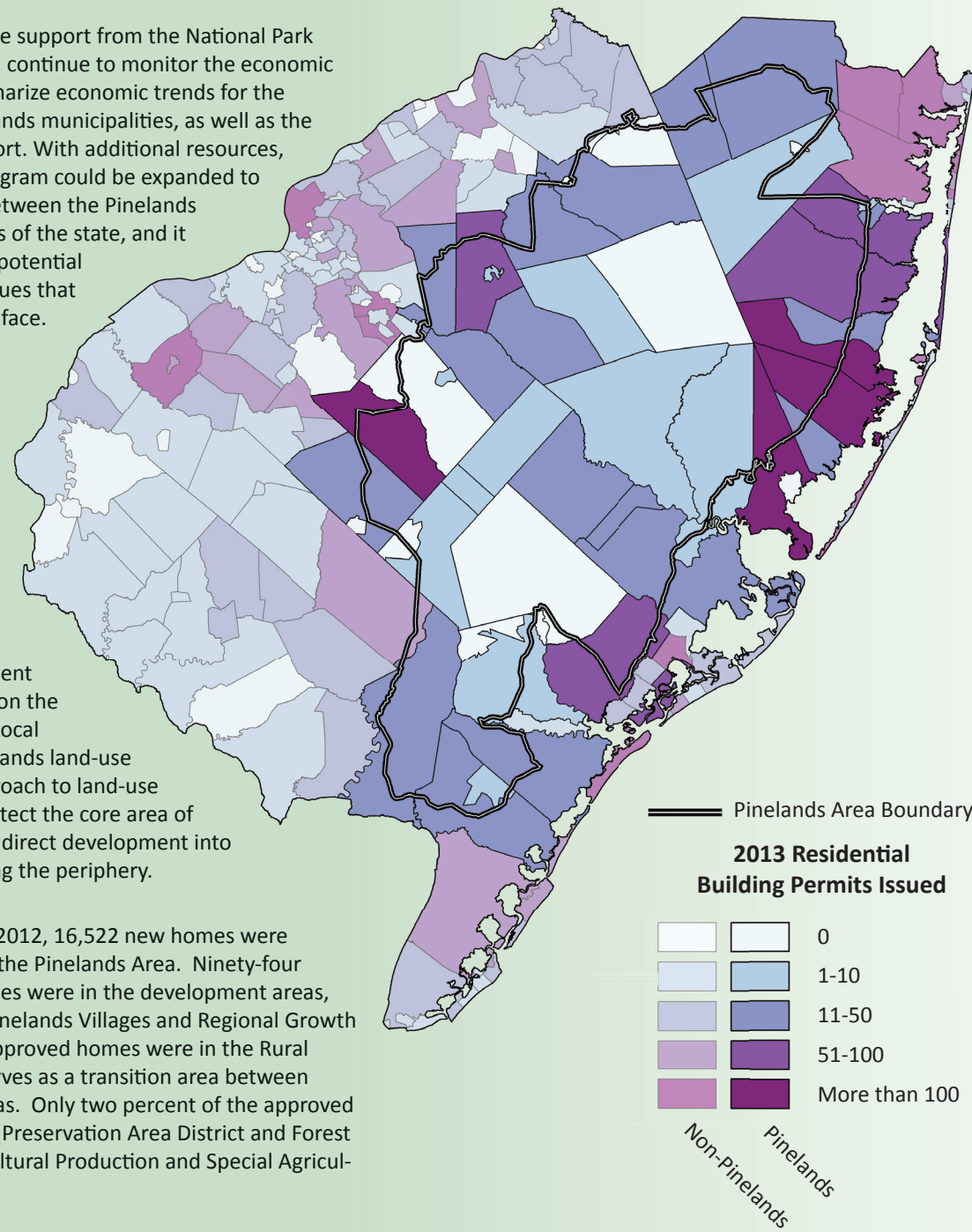
examination into the effectiveness of the Pinelands Development Credit program (the Commission's regional transfer of development rights program).

**Future Directions:** With future support from the National Park Service, Commission staff will continue to monitor the economic pulse of the region and summarize economic trends for the Pinelands and the Non-Pinelands municipalities, as well as the entire state, in its annual report. With additional resources, the Economic Monitoring Program could be expanded to investigate any differences between the Pinelands municipalities and other parts of the state, and it may be used to help identify potential remedies for various fiscal issues that Pinelands municipalities may face.

## Development in the Pinelands

Development in the Pinelands is regulated based on a series of nine management-area designations that vary by land use and development intensity. The nine management areas are shown on the map on the other side of this brochure. Local zoning must conform to Pinelands land-use standards. This regional approach to land-use planning was designed to protect the core area of the Pinelands ecosystem and direct development into designated growth areas along the periphery.

Between July 2001 and June 2012, 16,522 new homes were approved for construction in the Pinelands Area. Ninety-four percent of the approved homes were in the development areas, including Pinelands Towns, Pinelands Villages and Regional Growth Areas. Four percent of the approved homes were in the Rural Development Area, which serves as a transition area between growth and conservation areas. Only two percent of the approved homes were in conservation (Preservation Area District and Forest Area) and agricultural (Agricultural Production and Special Agricultural Production) areas.



## The Pinelands Economy ... Anything but Barren!

When the Pinelands Protection Act was adopted in 1979, some had feared the new regulations that were crafted to protect the environment would hurt the region's economy. But now, more than 30 years into the implementation of the Pinelands protection program, those fears have proven to be unfounded.

The Pinelands has outpaced or mirrored other parts of the state in numerous economic indicators.

Although tax rates are on the rise across the state, Pinelands residents have historically enjoyed lower tax burdens than the rest of southern New Jersey. Average municipal tax bills are about 13% lower for the Pinelands municipalities than those in the Non-Pinelands municipalities of southern New Jersey. Despite recent increases throughout the state, average effective tax rates -- municipal tax rates that are statistically adjusted to allow comparisons -- are lower in the Pinelands municipalities than in the Non-Pinelands municipalities and the state as a whole.

Like the rest of New Jersey, the Pinelands Area population has shown several decades of growth. In 1990, the Pinelands population was about 263,000. In 2010, Census figures show the population to have reached almost 313,000 people. The population growth rate inside the Pinelands Area boundary is greater than the population growth rate outside the boundary.

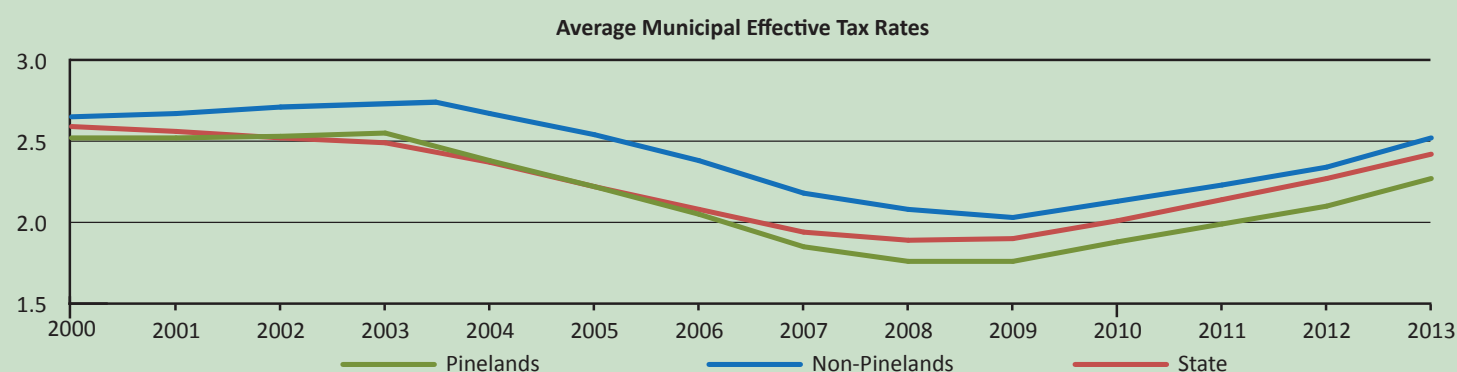
Real estate trends in the Pinelands municipalities roughly mirror and sometimes exceed those in the Non-Pinelands municipalities and the state. From 1980 to 2012, the Pinelands



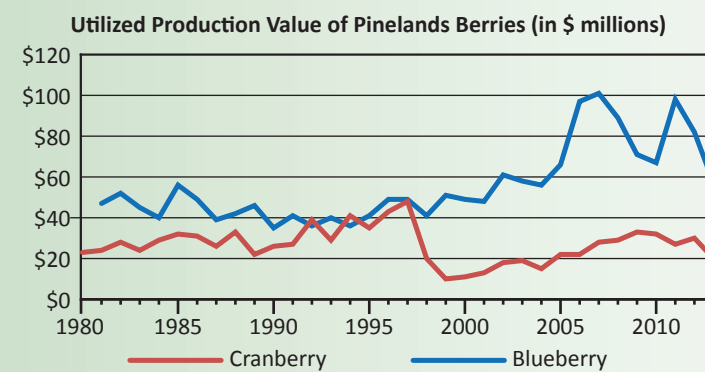
municipalities issued an average of 41 more residential building permits per year than the Non-Pinelands municipalities. From 1994 to 2013, the average values of homes sold have been lower in the Pinelands municipalities than Non-Pinelands municipalities. However, during the same period, the average number of homes sold in the Pinelands municipalities has exceeded that of the Non-Pinelands municipalities.

Historically, average per capita income has been less for the Pinelands municipalities compared to the Non-Pinelands municipalities, but the rate of growth for per capita income is greater in the Pinelands municipalities.

Across the state, unemployment rates rose in the early 1990s, only to fall in the late 1990s and 2000s. The recent recession



Above: Effective tax rates are typically lower in the Pinelands than in the Non-Pinelands municipalities and the rest of the state.



brought about an increase in unemployment rates. While the overall trend is for there to be lower rates of unemployment in the Pinelands municipalities, unemployment has been higher in the Pinelands than in the Non-Pinelands municipalities in the post-recession years.

Cranberries and blueberries are two plant species that are native to the Pinelands, and both play a major role in the state's agriculture industry. As of 2013, the value of utilized cranberry production was about \$20.3 million (3rd in the nation) and the value of blueberry production was about \$56.8 million (8th in the nation).

The full economic monitoring reports and data sources are available on the Commission web site ([www.nj.gov/pinelands](http://www.nj.gov/pinelands)).

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## Long-term Environmental and Economic Monitoring Program



## Long-term Environmental and Economic Monitoring

The Pinelands is a unique part of the National Park Service (NPS). The million-acre region is comprised of state parks, state forests, protected lands, farms and areas where development is encouraged. Providing for such diverse uses presents many challenges. The Pinelands Commission was created by state and federal law. To evaluate the Commission's success in implementing these laws, the Commission and the NPS established Economic and Environmental Monitoring programs. These programs are intended to evaluate the impacts of the Pinelands Comprehensive Management Plan, the rules that govern land use and development in the Pinelands. Questions to be answered include: Has the Commission been successful in achieving the goals of the federal and state laws? Have there been unanticipated impacts? These ongoing evaluations are key to ensuring the Commission's efforts are successful. The Commission has been conducting these evaluations since the 1990s. Over time, some of the components of the programs have changed.

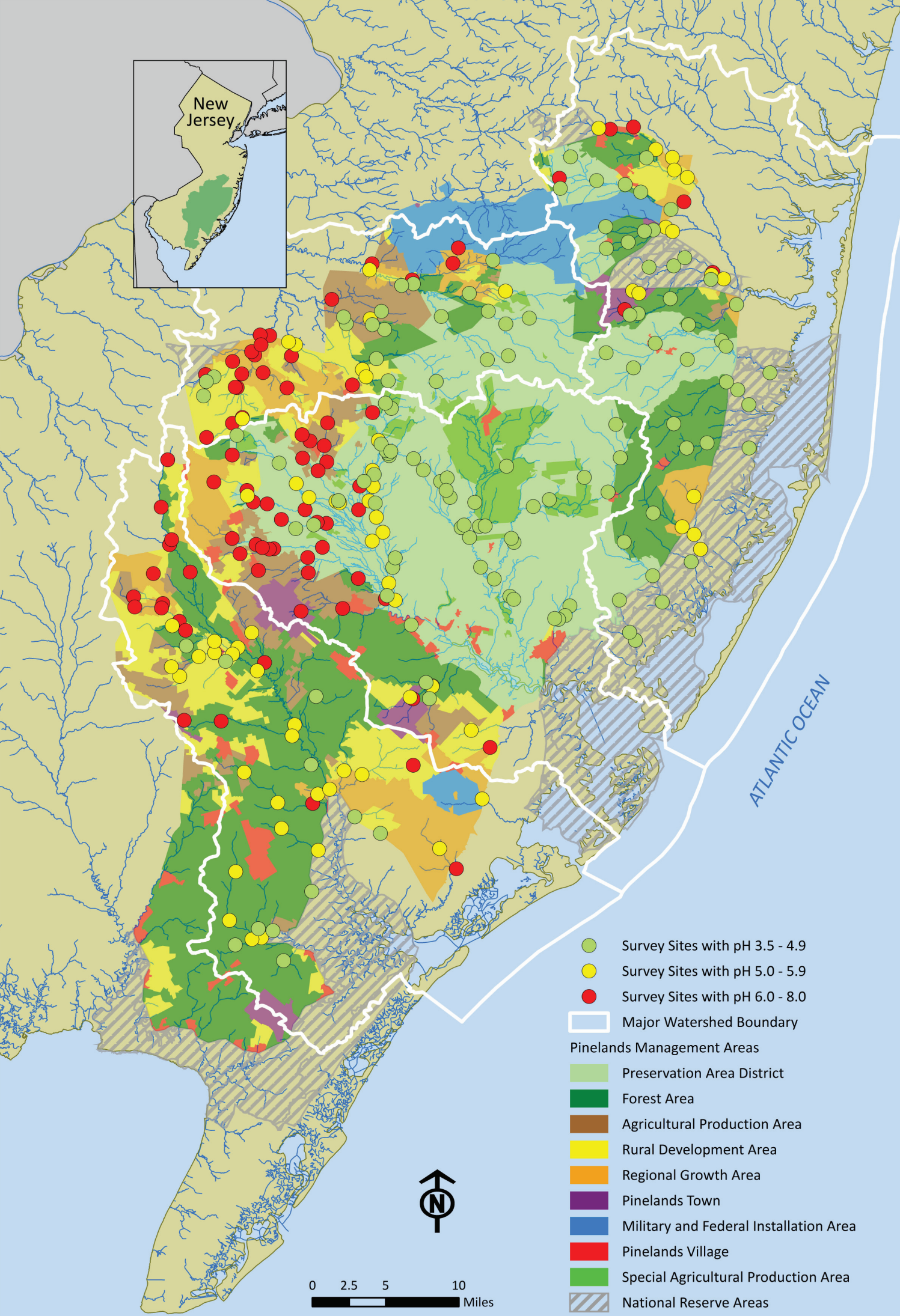
In addition to providing the Commission with data on the impacts of the Comprehensive Management Plan, the monitoring programs are a key component of the Commission's education and outreach efforts. Each year a report is produced and widely shared with other state agencies and the public. Data produced are also used by other entities studying the Pinelands as well as the towns and counties that comprise the Pinelands.

For more information, please log on to [www.nj.gov/pinelands](http://www.nj.gov/pinelands), or contact the Commission at P.O. Box 359, New Lisbon, NJ, 08064, (609) 894-7300.



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# Long-term Environmental Monitoring Program



The main objectives of the Long-term Environmental Monitoring Program are to characterize the effect of existing land-use patterns on aquatic and wetland resources in the Pinelands and to monitor long-term changes in these resources. Components of this program include watershed assessments, Pinelands-wide water-quality monitoring, water-level monitoring and frog and toad monitoring.

**Watershed Assessments:** To describe the relationship between land use, water quality and aquatic plants and animals, Commission scientists sampled streams and lakes in the four major Pinelands watersheds for pH and specific conductance and plants, fish and frogs and toads. The four major watersheds and the survey sites are shown on the map.

Results of the surveys demonstrated that streams and lakes in forested watersheds with little to no land disturbance were characterized by low pH (more acidic water), low specific conductance (few dissolved substances) and native Pinelands plants and animals, such as spatterdock, the blackbanded sunfish and the carpenter frog. In contrast, sites located downstream from land disturbance displayed elevated pH and specific conductance values and supported mixed native and non-native plants and animals. Examples of non-native species are water starwort, largemouth bass and bullfrog.

In Pinelands lakes affected by these upland land uses, greater numbers of non-native fish and bullfrogs are linked to fewer native fish and often the complete absence of the native carpenter frog. Non-native fish and bullfrogs grow much larger and likely prey upon and outcompete native fish and frogs.

The pH of a stream or lake can range from 1 to 14 and shows whether the water is acidic (pH 1.0-6.9), neutral (pH 7.0), or alkaline (pH 7.1-14.0). The map shows the range of pH values found at aquatic sites sampled as part of the environmental-monitoring program.

**Pinelands-wide Water-quality Monitoring:** From the pool of sites shown on the map, Commission scientists selected a group of 47 sites where pH and specific conductance are monitored every year. These sites represent the range of conditions found in each of the four watersheds and are used for assessing trends in pH and specific conductance over time. Specific conductance and pH are inexpensive, reliable and easily measured field parameters that are correlated with much more costly and episodic water-quality parameters, such as nitrogen and phosphorus.

**Water-level Monitoring:** Hydrology is one of the most important



A water-level graph for a Pinelands pond. Zero represents the ground, values above zero indicate surface-water depth in the pond, and values below zero show the groundwater level after the pond dries.

factors shaping the composition of plants and animals in wetland forests and coastal-plain ponds in the Pinelands. Commission scientists monitor water levels in 35 forest plots. The 35 forest plots represent an upland-to-wetland hydrologic gradient and are characterized as pine-oak upland, pitch pine lowland, pine-hardwood lowland, hardwood swamp or cedar swamp.

Water levels are also monitored in 37 coastal-plain ponds. Coastal-plain ponds are shallow wetland depressions that are scattered across the Pinelands landscape. These ponds may dry each year or so, and many of the ponds support rare species of plants and animals, such as the Pine Barrens treefrog and little floating bladderwort. Seven of the ponds have been outfitted with battery operated water-level recorders that continuously track the water-level fluctuations.

**Frog and Toad Monitoring:** Scientists also monitor vocalizing frogs and toads at 20 ponds each year. The 20 ponds were selected as long-term monitoring stations because they are located on the western side of the Mullica River Watershed along the interface between forest land and developed and farmed landscapes. Eleven frog species and one toad species have been heard calling from these ponds and 18 of the ponds serve as breeding habitat for the state-threatened Pine Barrens treefrog.



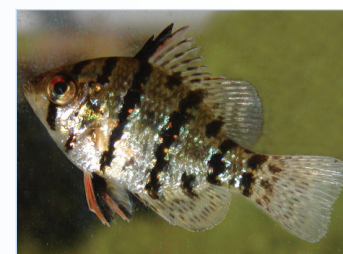
The native Pinelands carpenter frog's vocalization resembles the sound of a carpenter's hammer.



Spatterdock is a native Pinelands aquatic plant with floating leaves and an aerial flower.



One of the more colorful native Pinelands frogs is the Pine Barrens treefrog.



The blackbanded sunfish is a native Pinelands fish that grows only a few inches long.



A tiny and rare plant, little floating bladderwort, uses underwater bladders to capture small aquatic organisms.

**Policy Implications:** Information obtained through the Environmental Monitoring Program has been used to help protect important natural resources in the Pinelands. This includes helping to develop two sub-regional resource-protection plans, the Southern Medford/Evesham Plan and the Toms River Corridor Plan, and the rezoning and increased protection of the Oyster Creek Watershed and portions of the Waretown Creek Watershed. The connection between land use, water quality and aquatic and wetland plants and animals established through the monitoring program played a pivotal role in evaluating Pinelands habitat for the Commission's assessment of the region's ecological health.

Academic and government scientists from New Jersey and other states and countries, environmental consultants, land owners, students and citizens have requested data collected through the monitoring program for a variety of uses. Much

of the monitoring program data is available on the Commission's web site ([www.nj.gov/pinelands](http://www.nj.gov/pinelands)).

**Future Directions:** With ongoing support from the National Park Service, Commission scientists will continue to conduct the Environmental Monitoring Program. Scientists have completed a second round of water-quality and biological surveys in the four watersheds. These survey data will be used to further investigate the effects of land use on Pinelands water quality and aquatic communities, and to assess potential changes in conditions since the first round of surveys. Data from the Pinelands-wide water-quality, forest and pond water-level, and frog and toad monitoring components will be assessed for trends over time. If additional resources become available, the Environmental Monitoring program could be expanded beyond aquatic and wetland systems to investigate more terrestrial habitats in the Pinelands.

Black huckleberry in a pine-oak upland forest in the fall

Intermittent coastal-plain Pinelands pond in Brendan T. Byrne State Forest