



Cover image: Pitch pines are silhouetted by a setting sun in the Franklin Parker Preserve in the Pinelands.

Photo/John Bunnell

2019 Annual Report

New Jersey Pinelands Commission

Protecting the New Jersey Pinelands

The New Jersey Pinelands Commission is an independent state entity whose mission is to preserve, protect, and enhance the natural and cultural resources of the Pinelands National Reserve, and to encourage compatible economic and other human activities consistent with that purpose.

The Commission was created by the passage of the Pinelands Protection Act in 1979.

To accomplish its mission, the Commission implements a comprehensive plan that guides land use, development and natural resource protection programs in the 938,000-acre Pinelands Area of southern New Jersey. The Commission's 15-member board consists of state, county and federal appointees who volunteer their time and expertise. The panel meets monthly and receives guidance from its Executive Director and staff.



The Pinelands is home to vast forests, farms and towns that cover portions of seven counties in southern New Jersey. Photo/Paul Leakan

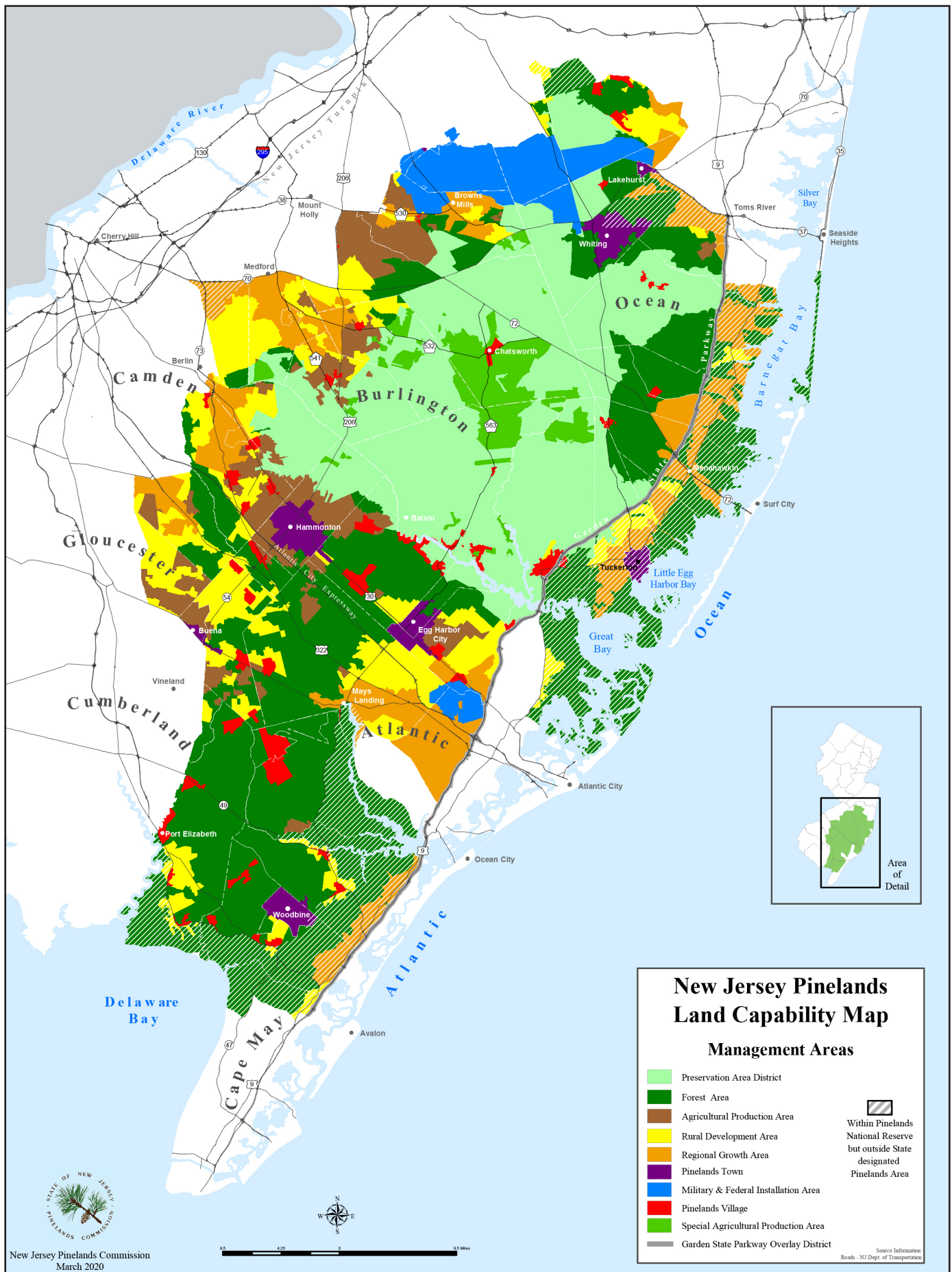
Commissioners:

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Alan W. Avery, Jr., Vice Chairman
Candace McKee Ashmun
Daniel Christy
Sean W. Earlen
D'Arcy Rohan Green
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Executive Director's Message

While Pinelands Commission staff maintain their ongoing work responsibilities, they are often called upon to expand their efforts to address changes in the world around us. The core of the Commission's work remains the review of development applications and local government plans and ordinances, as well as conducting baseline economic and environmental monitoring.

2019 brought an increased focus on climate change. The Commission has a great head start on addressing the impacts of climate change. As a regional land use planning entity, the Pinelands Commission established an overall land use plan for the Pinelands Area that has served to protect large areas of forested land while encouraging development in defined areas. The Commission's Comprehensive Management Plan already provides the basis for the protection of trees and wetlands and includes forestry provisions. These regulatory provisions help address climate change impacts by providing for carbon storage and improving water management.



The Pinelands is home to vast, unbroken forests that provide for carbon storage and help to improve water management. Photo/Joel Mott

Adding to this great framework, the Commission has been working on other ways to address the impacts of climate change. Staff members are evaluating ways to encourage solar installations in the Pinelands, including on many old landfill sites that are no longer in use. Water supply is a key climate change issue.

During 2019, with the help of many stakeholders, staff worked on new regulations to protect the Kirkwood-Cohansey aquifer. The draft rules will move to the proposal stage in 2020. The Commission's Land Use, Climate Impacts and Sustainability Committee (LUCIS) continues to be educated by climate change experts and has identified other topics to be considered, including agricultural practices, forest management and imperious cover alternatives. Improving the energy efficiency of our offices and adding solar and electric vehicle charging capacity are also being investigated.

The Pinelands Commission was established 41 years ago. The original Comprehensive Management Plan was ahead of the curve in ensuring the protection of large forested areas, streams and wetlands. Our staff is inspired to build on this framework to address issues we face today.

Handwritten signature of Nancy Wittenberg

Nancy Wittenberg
Executive Director

Planning Activities

Permanent Land Protection

The permanent protection of land remains among the top priorities for the Pinelands Commission.

In 2019, the Commission contributed \$66,667 from its Pinelands Conservation Fund (PCF) toward the permanent preservation of a 202-acre property located in the Pinelands Area of Pemberton Township, Burlington County.

The property is a former blueberry farm that is located in a Pinelands Agricultural Production Area. It connects portions of the 33,647-acre Brendan T. Byrne State Forest, and it contains extensive wetlands.

The parcel provides habitat for numerous threatened or endangered plant and animal species, including Pickering's morning-glory, argos skipper, Pine Barrens treefrog, northern pine snake and corn snake.

The Commission supported the acquisition of the property based on its high ecological value and the need to prevent further damage from illegal off-road vehicle use onsite. The Rancocas Conservancy, which is the recipient of the PCF grant, will enforce a ban on motor vehicle activity on the property.

The Commission permanently preserved a total of 800 acres in the Pinelands Area through its most recent round of PCF acquisitions.

By the Numbers:

- From 2007 to 2019, the Commission contributed \$9.42 million to 40 land acquisition projects in the Pinelands Area.
- All 40 projects have been completed as of December 31, 2019, resulting in the permanent protection of 8,969 acres.
- More than half (477,000 acres) of the land in the Pinelands Area has been permanently preserved.



In 2019, the Commission provided funding for the permanent preservation of a 202-acre property in Pemberton Township. The former blueberry farm contains extensive habitat for numerous rare plant and animal species.

Photos/Paul Leakan

Commission Forms New Land Use, Climate Impacts and Sustainability Committee



In early 2019, the Commission formed a new committee that is identifying potential impacts caused by climate change in the Pinelands. Photo/Paul Leakan

In 2019, then-Chairman Sean Earlen called for the creation of a new committee to review the potential effects of climate change in the Pinelands and consider measures to mitigate impacts.

The seven-member Land Use, Climate Impacts and Sustainability (LUCIS) Committee has met twice since its formation.

Thus far, the Committee has discussed various challenges posed by climate change, while expressing a desire to hear from experts on the topic before prioritizing potential actions, including amendments to the Pinelands Comprehensive Management Plan, the rules that govern land-use, development and resource protection in the

Pinelands Area. In addition to gathering information from staff members, the Commission hosted a presentation on the state's community solar program, as well as a presentation entitled "Climate Projections and Potential Actions."

Pinelands Development Credit Program

The Pinelands Development Credit Program is a regional transfer of development rights program that preserves important agricultural and ecological land. Pinelands Development Credits (PDCs) are allocated by the Commission to landowners in the Preservation, Agricultural Production and Special Agricultural Production Areas, which are the sending areas. PDCs can be purchased by property owners and developers who are interested in developing land in Regional Growth Areas, which serve as the receiving areas.

Once PDCs are "severed" from a sending area property, the property is permanently protected by a conservation or agricultural deed restriction and the PDCs allocated to that property can be sold on the private market.

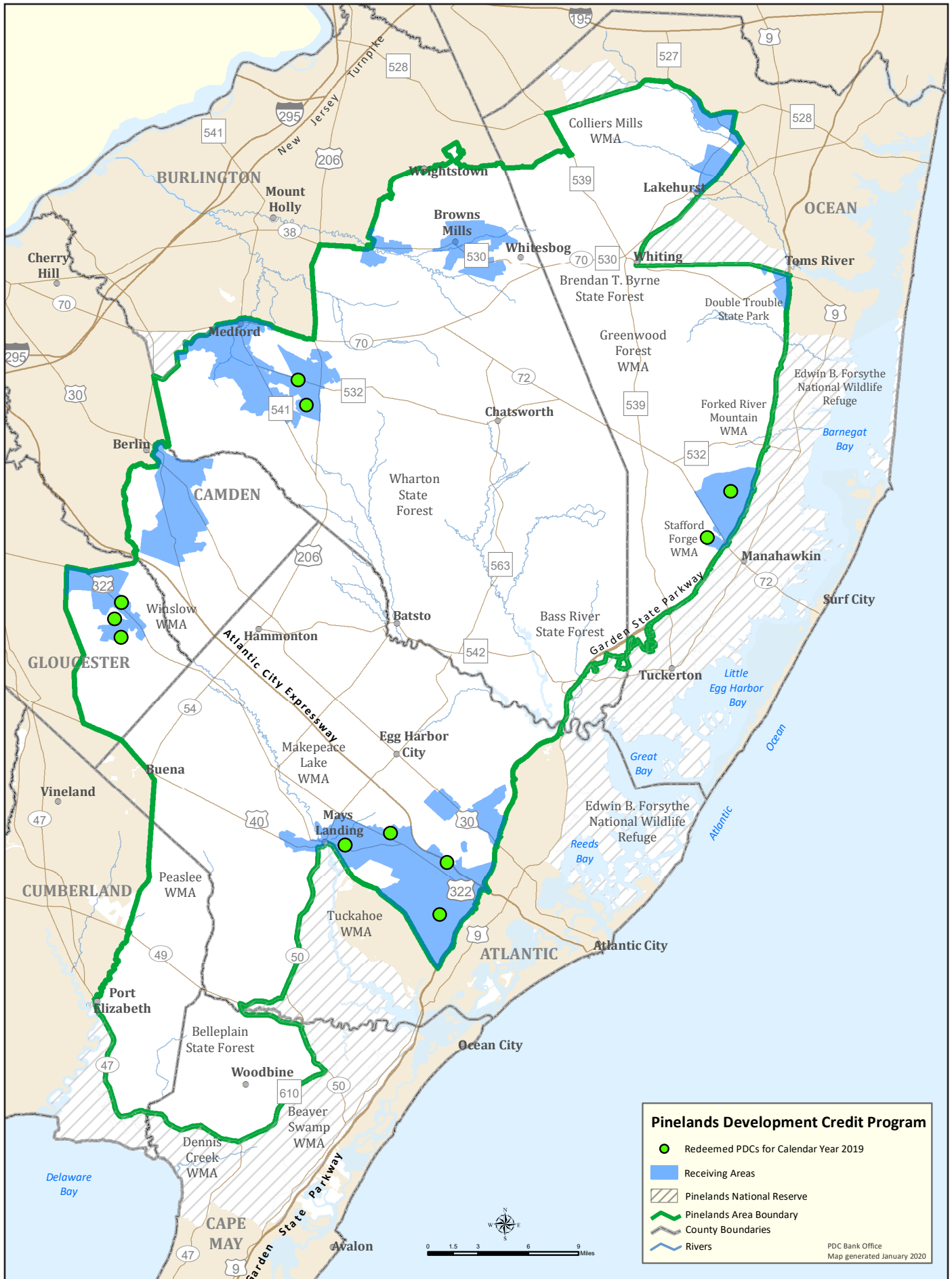
During 2019, 96.50 PDCs were allocated by the Commission to 21 sending area properties. A total of 69.75 PDCs were severed, protecting 3,046 acres of land in the Preservation Area District in Lacey



Pinelands Development Credits were redeemed for the construction of this 194-unit residential development in Egg Harbor Township's Regional Growth Area in 2019.

Photo/Paul Leakan

and Ocean townships. Since 1982, 55,392 acres in the Pinelands Area have been permanently preserved through the PDC Program. In 2019, a total of 16.00 PDCs were sold, with an average sales price of \$38,138 per PDC. A total of 69.25 PDCs were redeemed for nine residential projects in Barnegat, Egg Harbor, Monroe, Shamong and Stafford townships and two nonresidential projects in Hamilton and Tabernacle townships during 2019. Please see page 3 for a map that illustrates all PDC redemptions that occurred in 2019.



Reviewing Municipal Ordinances

The master plans and land use ordinances of all Pinelands municipalities and counties must be consistent with the Pinelands Comprehensive Management Plan (CMP). Consistency is ensured through the conformance process, by which municipalities and counties submit their plans, ordinances and amendments to the Commission for review and certification.

During 2019, the Commission received and reviewed 118 municipal master plan and ordinance amendments.

The Commission staff works closely with Pinelands municipalities to help them achieve their objectives in a manner that is consistent with the CMP.

In 2019, the Commission certified several redevelopment plans for properties in Regional Growth Areas and Pinelands Towns. This included plans in Pemberton Township (the former Rowan College at Burlington County campus), Monroe Township (mixed use development on the Black Horse Pike), Winslow Township (a residential area on Route 73), Egg Harbor City (commercial development on the White Horse Pike) and Hammonton (adaptive reuse of a former motor inn).

Pinelands Infrastructure Trust Fund

In 2019, the Pinelands Commission recommended the funding of five infrastructure projects from the Pinelands Infrastructure Trust Fund (PITF).

The PITF was established in 1985 to help local governments and utility authorities defray the costs associated with supporting the population and economic growth targeted to Pinelands Regional Growth

Management Areas. The types of infrastructure that may be funded include wastewater treatment and collection systems, stormwater management facilities, water supply systems, and transportation projects.

In 2019, the Commission adopted an amendment to the Pinelands Infrastructure Master Plan that includes criteria for ranking project proposals.

After adopting the amendment, the Commission received and evaluated a total of 10 projects that sought funding for various water supply, wastewater and transportation projects. A second Infrastructure Master Plan Amendment allocated the remaining portions of the PITF and recommended awarding a total of nearly \$16 million in PITF grants and loans to the following project sponsors:

■ **Pemberton Township** - \$2.6 million for water system

improvements;

■ **Jackson Municipal Utilities Authority and Manchester Township** - \$5.4 million for water and sanitary sewer main extensions;

■ **Monroe Township** - \$3.2 million for transportation improvements at the Williamstown Square project;

■ **Galloway Township** - \$3.1 million for sanitary sewer main extensions in the Pinehurst Area; and

■ **Winslow Township** - \$1.4 million for water and sanitary sewer main extensions in the Route 73 Redevelopment Area.

The infrastructure project sponsors may advance to the New Jersey Infrastructure Bank to complete the funding administrative process, although no project sponsor is required to continue.

Project sponsors are responsible for completing the administrative process and for obtaining any other permits or documents necessary for project construction.

Given the Commission's adoption of the amended Infrastructure Master Plan and the recommendations for funding, all available funding from the Pinelands Infrastructure Trust Fund has been allocated.



Pine Barrens Byway

The Pinelands Commission took several steps to increase its involvement with the Pine Barrens Byway in 2019.

After consulting with the New Jersey Department of Transportation (NJDOT), the Commission agreed to assume the role as the formal management entity for the Byway, which is a state-designated route that traverses 130 miles of existing roadways in portions of Atlantic, Burlington, Cape May, Cumberland and Ocean counties.

The Commission plans to convene a meeting of stakeholders and interested parties in early 2020. When new federal application rounds are announced, the Commission will also complete the application for National Scenic Byway status. The national designation could provide additional grant opportunities to support the byway.

Meanwhile, Commission staff has been assisting the NJDOT with its efforts to market the Byway. The NJDOT is developing a Scenic Byways “marketing toolkit” that will include an overview book, tri-fold brochure and all-season photo library of all eight scenic byways in New Jersey. The NJDOT hired a



The Pine Barrens Byway meanders through 16 municipalities in the Pinelands, offering scenic views of the region’s natural and historic sites, including the remains of the Pleasant Mills Paper Mill in Mullica Township (shown above). Photo/Joel Mott

team of consultants to take photographs of each byway and interview byway representatives. Staff met with the consultants in September 2019 and provided detailed information on the Pine Barrens Byway as part of a “content gathering interview.”

Commission staff also accompanied a photographer who was hired by the consultant to take photos of various sites along the byway. Additional photo shoots are planned for the winter, spring and summer of 2020.

Alternate Design Treatment Systems Pilot Program

The Commission issued its annual Implementation Report for the Alternate Design Treatment Systems Pilot Program in November 2019.

The Pilot Program was launched in 2002 as a means to test high-performance wastewater treatment systems that better protect Pinelands water resources. Through the program, the Commission has evaluated numerous septic systems technologies and identified several that successfully meet Pinelands water quality standards for residential development on lots as small as one acre.

The Implementation Report calls for the continuation of the Pilot Program, while recommending the removal of three treatment system technologies: BioBarrier, Busse and Hoot. The report also recommends recognizing the success of one system technology (SeptiTech) by authorizing its use for residential development on a permanent basis. Lastly, the report calls for adding as many as six new technologies in 2020. The new technologies would be certified by the NSF International and/or U.S. Environmental Protection Agency ETV programs. The recommendations will be incorporated into a proposed amendment to the Pinelands Comprehensive Management Plan in early 2020.

Regulatory Activities

Applications

The Pinelands Commission reviews applications for development by evaluating proposals to ensure that they meet the regulations contained in the Pinelands Comprehensive Management Plan.

Development proposals must meet a series of environmental standards, including those that protect water quality, wetlands and threatened and endangered species.

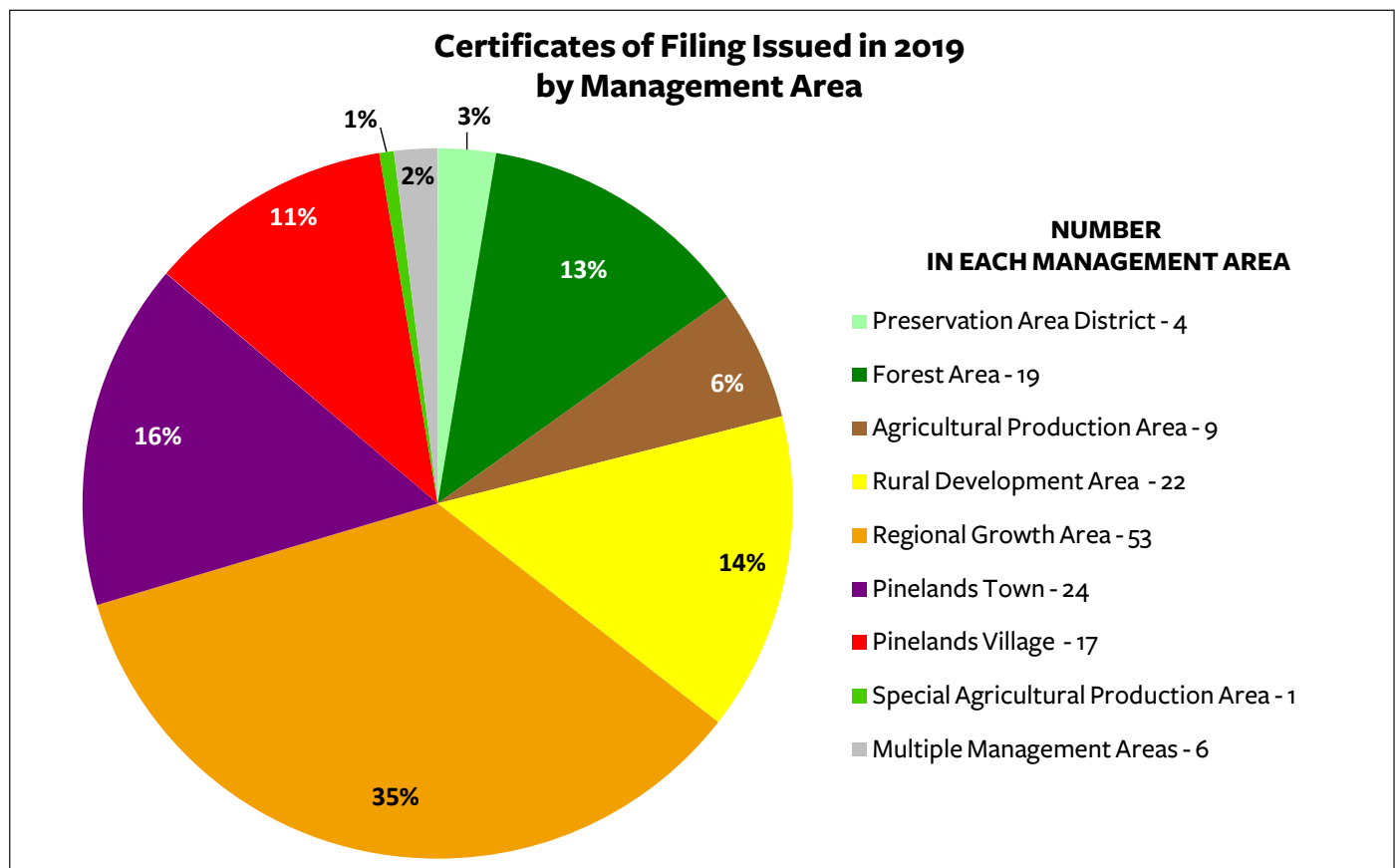
The Commission’s development approval process varies, depending on whether the application is submitted by a public agency or a private landowner. The Commission’s staff reviews private development proposals, such as single-family dwellings, subdivisions and commercial projects. After applicants provide all of the necessary information, the Commission issues a Certificate of Filing (or CF) that allows applicants to seek all municipal and county approvals for the proposed development.



Branwen Ellis, an Environmental Specialist with the Pinelands Commission, takes soil borings as part of reviewing an application for development.

Photo/Paul Leakan

The Commission issued 152 Certificates of Filing (CFs) in 2019, most of which (53) were for proposed development in Regional Growth Areas (as shown in the chart below). There are 24 municipalities with Regional Growth Areas in the Pinelands Area. Most development in the Pinelands is channeled to Regional Growth Areas, which are areas of existing growth and adjacent lands capable of accommodating additional residential and nonresidential development.



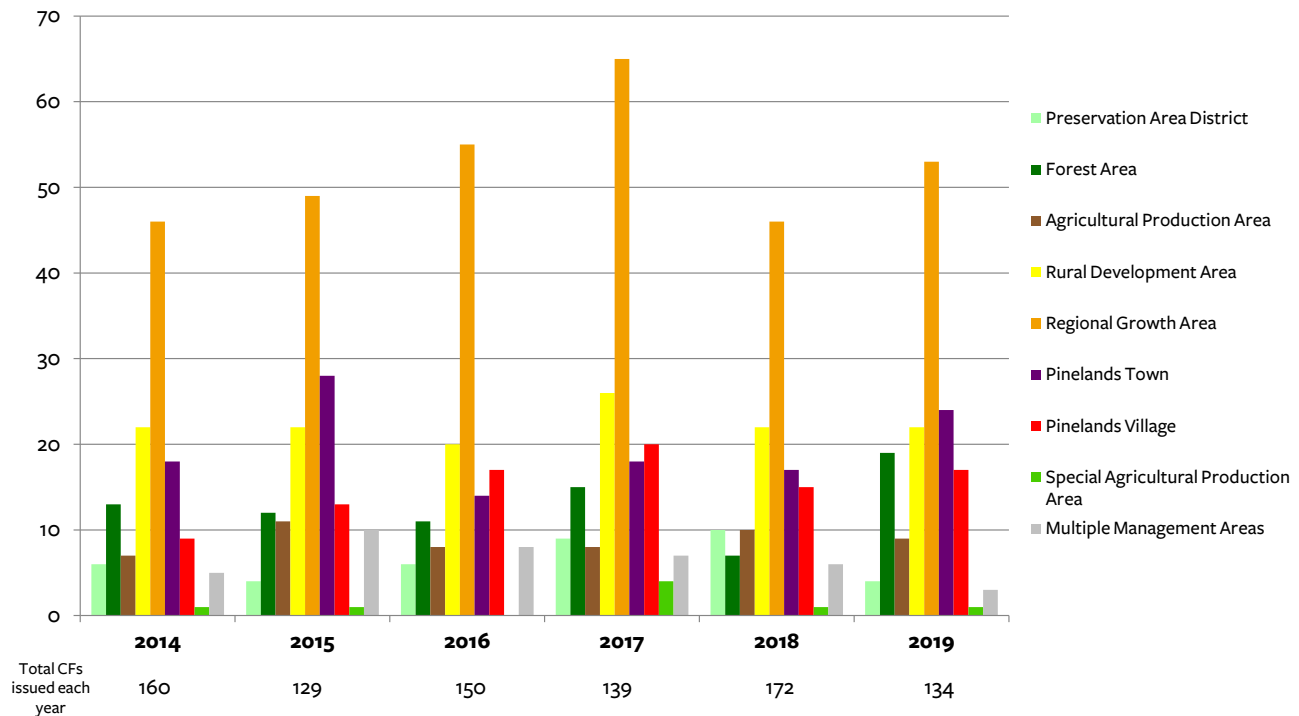
Of the 152 CFs that were issued in 2019, most involved proposals for residential development, followed by commercial development (as shown in the table below).

Certificates of Filing Issued in 2019 by Management Area and Type of Development

	Residential	Commercial	Infrastructure	Institutional	Resource extraction	Totals by management area
Preservation Area District	2				2	4
Forest Area	15	1	1		2	19
Agricultural Production Area	8	1				9
Rural Development Area	13	5			4	22
Regional Growth Area	29	22	2			53
Pinelands Town	14	9		1		24
Pinelands Village	11	2	2	2		17
Special Agricultural Production Area		1				1
Multiple management areas	2	1				3
Totals by type of development	94	42	5	3	8	152

The Commission issued similar numbers of CFs from 2014 to 2019, with the majority of the proposals for development located in Regional Growth Areas (as shown on the bar graph below).

Certificates of Filing by Management Area 2013 - 2019



The Pinelands Commission is also responsible for reviewing and approving development applications that are submitted by public entities, such as a municipality, county or a State agency. The full, 15-member Commission votes on whether to approve these applications during its monthly meetings.

The Commission approved a total of 33 applications for public development in 2019. Examples included the construction of a municipal building and the installation of ground-mounted solar panels, as well as improvements to roads, dams, sewer mains and water treatment facilities.

Recreation Permits

In 2019, the Commission issued 17 Recreation Permits for organized, off-road vehicle events in the Pinelands.

In order to receive a Recreation Permit, groups must submit a completed “Off-Road Vehicle Event Application” for each proposed event. In addition to the application form, the group must submit the course route in electronic format, an application review fee, proof of insurance, property owner permission and proof that the township and New Jersey State Police have been notified.

Commission staff reviews the course route to determine if there are any issues with wetlands, threatened and endangered species, deed-restricted land and private and public ownership. Any portions of the route that have potential issues are site inspected by a member of the Commission’s staff. If any route changes are necessary, a revised route is required and must again be submitted for review.



Brian Szura, an Environmental Specialist with the Pinelands Commission, conducts site inspections of proposed course routes for organized, off-road vehicle events. Photo/Paul Leakan

Resolving Violations

In 2019, Commission staff members worked closely with a municipality to address the offsite removal of soil from a 62 acre parcel. The parcel contained a fallow agricultural field. The owner initially represented that the soil was being removed to level the parcel for the installation of agricultural greenhouses. It is estimated that soil was extracted and removed from approximately 35 acres of the parcel. The CMP requires the completion of an application with the Commission if more than 2,000 cubic yards of soil is removed from a parcel for agricultural purposes in a given year. The responsible party pleaded guilty to the violation in municipal court, agreed to a substantial monetary penalty and agreed to address certain remaining issues with the Pinelands Commission.

Amended Memorandum of Agreement with the South Jersey Transportation Authority

In 2019, the Commission amended its Memorandum of Agreement (MOA) with the South Jersey Transportation Authority (SJTA) to eliminate seasonal mowing restrictions at the Atlantic City International Airport in Egg Harbor Township.

The SJTA sought the amendment, citing concerns about aviation safety at the airport. Specifically, the SJTA reported an increase in the number of damaging interactions between planes and birds, and raised concerns

that the presence of the onsite Grassland Conservation Management Area (GCMA) was contributing to these increased bird strikes. The GCMA was created onsite as part of the original MOA that was reached in 2004 in order to offset impacts from development approved by the MOA to two protected bird species, the grasshopper sparrow (a threatened species) and the upland sandpiper (an endangered species.)

The amended MOA authorizes the SJTA to relocate the grassland and conservation management area off the airport property and allows it to mow the existing grassland habitat on the property year-round. Previously, the SJTA was restricted from mowing the grassland management area between April 15th and August 15th.



Aerial map of the Atlantic City International Airport
in Egg Harbor Township

In exchange for lifting the mowing restrictions, the amended agreement requires the SJTA to:

- Make an initial payment of \$500,000 to the Commission's Pinelands Conservation Fund (PCF). The funds will be used to acquire land within the Pinelands Area in accordance with the priorities established by the Commission and, if available, will contain suitable habitat for threatened or endangered grassland birds;
- Make five additional annual payments of \$500,000 each. The funds will be added to the PCF for land acquisition;
- Acquire land within the Pinelands for creating and maintaining a new grassland conservation and management area. At least 62 acres of the property must be already cleared and must be located at least 50 meters from any structure or the forest edge; and
- Enhance an approximately 12-acre site located adjacent to the Forest Preservation Area in the northeast quadrant of the airport by planting wild indigo. The site would provide habitat for the frosted elfin butterfly, which is a threatened species in New Jersey.

Electric Transmission Right-of-Way Vegetation Management Plan and Pilot Program

In 2019, the Commission continued to analyze the success of a pilot program that implements a vegetation-management plan for rights-of-way located beneath 233 miles of high-voltage electric-transmission lines in the Pinelands.

The Commission approved the right-of-way (ROW) vegetation-management plan in 2009, in cooperation with the New Jersey Board of Public Utilities and three utility companies, and as part a 10-year Pilot Program in the Pinelands Comprehensive Management Plan. Under the plan, the utility companies are required to manage the vegetation within rights-of-way according to specific prescriptions that are designed to maintain early successional habitats and preserve wetlands integrity while ensuring transmission line safety.

The Commission's Regulatory Programs Office conducts site inspections of the ROWs to determine if the prescriptions are being followed correctly. Meanwhile, Commission scientists survey vegetation study plots to

assess the effects of the prescriptions. Commission scientists have completed all field work associated with the vegetation-monitoring component of the program. In 2019, scientists analyzed the vegetation data and began preparing a report on the vegetation monitoring component.

In 2019, the Commission extended the Pilot Program for two years in order to provide an opportunity to fully assess the results of the program, evaluate any necessary amendments and come up with a long-term plan for implementing the ROW Plan.

Science & Research Activities

Long-term Environmental Monitoring Program

The Commission continued to conduct long-term environmental monitoring research, which included an ongoing study of snake fungal disease.

In 2018, Commission scientists began collaborating with Dr. Joanna Burger and her colleagues at Rutgers University, Robert Zappalorti of Herpetological Associates, and Dr. Jeffrey Lorch of the United States Geological Survey (USGS) to conduct research on snake fungal disease in the Pinelands. Snake fungal disease is an emerging disease found in populations of captive and wild snakes and has been found to infect snakes in North America, parts of Europe, and Australia. Laboratory analyses have demonstrated that the fungus *Ophidiomyces ophiodiicola* is consistently associated with snake fungal disease, but often additional fungi are also found. Although snakes can show signs of fungal disease just after spring emergence from hibernation, it was previously unknown if *O. ophiodiicola* was present inside the hibernacula.

Dr. Burger and Mr. Zappalorti have been excavating a group of northern pine snake hibernacula, or winter dens, annually for the past 35 years. Their long-term study provides a unique opportunity to sample inside snake dens to determine if the fungus is present in the soil or on the hibernating snakes. Excavating the dens during hibernation also allows the sampling of a number of individual snakes from a population at one time. A passive integrated transponder (PIT) tag is inserted into each snake found during the excavations. A PIT tag is a tiny, glass-coated microchip commonly used in wildlife research that allows for the permanent identification of an animal through the use of a special scanner that reads the unique tag number.

Initial sampling completed in 2018 indicated that *O. ophiodiicola* was present on snakes and in the soil inside the dens. In 2019, a second round of sampling was completed on hibernating snakes. A total of 35 pine snakes, one corn snake, one black racer, and one timber rattlesnake were found during the excavations. Each snake was swabbed for the fungus on the head, belly, vent, and on visible body sores. Preliminary results show that the fungus was present on the visible body sores much more than the other body locations sampled. During the winter of 2020, all snakes found during the den excavations will be swabbed again in an effort to determine the best method and body location to sample a snake for the presence of the fungus and to document changes in fungal infection for individual snakes over time.

Other 2019 environmental monitoring activities included surveying calling frogs and toads at a group of ponds that are surveyed annually, measuring bimonthly water quality at 47 stream sites, recording monthly water levels at 35 forest plots and 30 ponds, and maintaining continuous water-level recorders installed in seven other ponds and in a shallow observation well installed within a pine lowland forest.



The soft and crusty brown blotches on this northern pine snake indicate potential snake fungal disease.

Photo/ John Bunnell

Microorganism Study

In 2017, the Commission was awarded funding to study the effects of land use on water quality and microorganisms in 60 natural ponds, excavated ponds, and stormwater basin study sites. The following year, field work was initiated at 20 of the 60 wetlands. Commission scientists and collaborators with the N.J. Department of Environmental Protection and U.S. Geological Survey sampled surface water for nutrients, metals, pesticides, and chlorophyll-a (an indirect measure of algal plant growth) and collected samples of diatoms (single-celled algae), phytoplankton (free-floating algae in the water), zooplankton (tiny animals that swim or drift in the water), and benthic macroinvertebrates (primarily aquatic larval insects).

The goals of the Microorganism Study are to assess the relationship between surrounding land use and the various water-quality and biological attributes and to compare the plants and animals from natural and created wetlands.

In 2019, scientists collected water quality data and microorganism samples at 20 different sites. Taxonomic consultants are in the process of



Zooplankton samples were collected at 20 sites in 2018 and 20 sites in 2019. This species (*Tropicocyclops prasinus mexicanus*) is less than 1 mm long and was primarily associated with excavated ponds.

Photo/ John Bunnell

identifying zooplankton, algae, diatoms, and macroinvertebrates from collections made in 2018 and 2019.

This research is being funded by a grant from the U.S. EPA and a match by the Commission through its Pinelands Conservation Fund.

Endocrine Disruption Study

The William Penn Foundation recently dedicated significant funding towards scientific research in the Delaware River Watershed through the Delaware Watershed Research Fund. The Academy of Natural Sciences is administering the funding. The Kirkwood-Cohansey aquifer, which underlies the Pinelands, was identified as one of the research areas eligible for funding. Commission scientists and U.S. Geological Survey scientists Kelly Smalling, Dr. Vicki Blazer, and Heather Walsh proposed a study to investigate point and non-point sources of endocrine disrupting chemicals and the potential impacts on fish and frogs in the Pinelands. The proposed study was awarded funding in 2016.

The endocrine system is a collection of tissues in animals that produce hormones to regulate essential life processes, such as metabolism, tissue function, reproduction, and development. A large group of natural and synthetic chemicals are known to disrupt endocrine function. Examples include plant hormones, plastic components, flame retardants, surfactants, fragrances, pesticides, etc. Endocrine disrupting chemicals, or EDCs, are a global environmental problem and have been linked to



Non-native largemouth bass (top) and bluegill (bottom) will be sampled for evidence of endocrine disrupting chemicals at sites upstream and downstream of sewage treatment plants.

Photos/ John Bunnell

reproductive and developmental abnormalities in a variety of animal species, especially fish and amphibians.

Commission and U.S. Geological Survey scientists will sample water chemistry and fish above and below municipal wastewater treatment plants, which represent direct point sources of EDCs, and water chemistry and frogs at ponds and stormwater basins, which may receive indirect non-point sources of EDCs from runoff and the aquifer. Results from these sites will be compared to those from appropriate minimally impacted reference sites.

In 2017, 2018, and 2019, green frogs were collected from ponds and stormwater basins for histological analysis, and water chemistry was sampled at the sites on multiple occasions. In 2019, fish were collected from stream sites above and below a sewage treatment plant for histological analysis, and water chemistry was also sampled. The remaining sites, which are lakes above and below a different sewage treatment plant, will be surveyed in 2020.

The study is being funded by a grant from the Delaware Watershed Research Fund, a match by the Pinelands Commission, and a match by the USGS.

Corn Snake Radio Tracking and Drift Fence Study

In 2017, Commission scientists began to collaborate with Dr. Howard Reinert of The College of New Jersey, Mr. Robert Zappalorti of Herpetological Associates, and the New Jersey Department of Environmental Protection (NJDEP) Endangered and Nongame Species Program staff to conduct an intensive research project on the corn snake in the Pinelands.

The corn snake is a colorful, secretive species of rat snake that reaches the northern limit of its range in the New Jersey Pine Barrens. Also called the red rat snake, the corn snake is listed as an endangered species by the NJDEP.

The goals of the corn snake research is to better understand the habitat requirements and life history of this secretive serpent in order to develop meaningful conservation management programs for the species and ensure its continued survival in the Pinelands.

The research includes two components: radio-telemetry and headstarting, which is a conservation technique where vulnerable young animals are raised in captivity until they attain a larger size and then released into the wild.

For the telemetry aspect, researchers surgically implant small radio-transmitters in adult corn snakes and locate the snakes on a regular basis to collect data on their activity range; types of habitats used; and the locations for nesting, shedding, and hibernation. In 2019, scientists completed radio tracking of 29 corn snakes. Corn snake telemetry data will be analyzed by research collaborators at The College of New Jersey.

For the headstarting component of the study, researchers collect corn snake eggs from nest areas and transport



Pinelands Commission Chief Scientist John Bunnell is among several researchers who are radio tracking corn snakes in the Pinelands.

Photo/Paul Leakan

them to a laboratory for incubation and hatching. All of the hatchlings are microchipped and one-half of them are released back to the primary nest area as “cold released” snakes. (Cold released snakes are hatchlings that are released the same year that they were born). The other group of hatchlings are kept in the laboratory over the winter and released the following spring as headstarted snakes. The goal is to recapture as many of these snakes as possible to assess growth and survivorship of the cold released and headstarted hatchlings over time.

While in the laboratory, hatchlings are fed, weighed, and measured to determine the efficiency of assimilating food and their growth rates. Researchers are also conducting experiments on the laboratory hatchlings to understand their preferences for temperature, the amount of vegetation canopy cover, and whether they prefer to lay on sand, soil, leaf litter, or pine needles.

In 2019, 28 headstarted corn snakes from 2018 and 11 newly hatched corn snakes from 2019 were released at the primary nest area. Twenty-two newly hatched corn snakes were selected to be held over the winter to be released in the spring of 2020. A drift fence was established at the primary nest area to help recapture corn snake hatchlings to assess the survival of headstarted and cold released hatchlings and to compare the effectiveness of using a drift fence outfitted with box traps and artificial cover to detect corn snakes and other species of snakes. In 2019, a total of 1,994 animals were found along the drift fence, under the artificial cover, or in the box traps. Thirteen species of snakes were captured, including 19 corn snakes.

The Joint Corn Snake Study is being funded by the Pinelands Commission and the New Jersey Department of Environmental Protection.

Eastern Kingsnake Study

In 2019, the Commission was awarded funding for a grant proposal, titled “Activity range, habitat use, shedding, denning, and nesting of the wetland-dependent eastern kingsnake.”

The eastern kingsnake is listed as a species of special concern in New Jersey because it is vulnerable to multiple threats, is potentially declining, and its distribution and population status are not known. Although kingsnakes are a wetland-dependent species that use wetlands for overwintering, the specific wetland habitat types needed for hibernation and the amount and type of associated upland habitats used for foraging, shedding, and nesting have not been documented.

Commission scientists are collaborating with Mr. Robert Zappalorti of Herpetological Associates and Dr. Howard Reinert of The College of New Jersey on this four-year study.



A four-year study will focus on the wetland-dependent eastern kingsnake.

Photo/John Bunnell

Scientists will use radio telemetry to determine the activity range; upland and wetland habitat use; and timing of shedding, denning, and potentially nesting of the eastern kingsnake.

In anticipation of obtaining funding and to ensure an adequate number of snakes to track if funding was secured, radio transmitters were surgically implanted in 13 kingsnakes in 2019. Although one kingsnake was killed by a predator, the remaining 12 snakes were tracked to their winter dens. These 12 kingsnakes and other kingsnakes found that are large enough to accept a radio transmitter will be tracked throughout 2020.

This research is being funded by a grant from the U.S. EPA and a match by the Commission through the Pinelands Conservation Fund.

Public Information, Education & Outreach

Raising Awareness, Fostering Stewardship

In 2019, the Commission's staff organized and executed two dozen educational programs that raised awareness and appreciation of the Pinelands.

The Commission partnered with Stockton University to carry out the 30th annual Pinelands Short Course on March 9th and the third-annual Pinelands Summer Short Course on July 18th. The two events featured a total of 52 presentations that showcased the natural, cultural and historic resources of the Pinelands. More than 600 people attended the events.

On July 23rd, staff organized the annual Pinelands Orientation for Newly Elected Officials. The event is co-sponsored by the Pinelands Municipal Council, and it provides municipal officials with an opportunity to learn about the inner-workings of the Pinelands protection program. Twenty-five municipal officials attended.

On October 25th, staff organized and carried out its 13th annual, Pinelands-themed World Water Monitoring Challenge event. Held at the historic Batsto Village, the event attracted 200 students and teachers who gauged Pinelands water quality and learned about how the Commission and other agencies safeguard Pinelands resources.

The Commission also created a "scavenger hunt" that was used to educate students who visited the Candace McKee Ashmun Pinelands Education Exhibit, which is located in the Commission's headquarters.

By the Numbers:

In 2019, the Commission's staff:

- Organized and carried out 20 educational programs;
- Educated more than 1,500 people about the Pinelands;
- Responded to more than 1,500 public inquiries about recreation and other non-development application questions; and
- Maintained the Commission's website, which was viewed a total of 152,669 times.



Above: Jeff Dragon, a Commission Research Scientist, helped students catch numerous aquatic species at the World Water Monitoring Challenge.

To the right: The third annual Pinelands Summer Short Course included a tour of a Hammonton brewery that uses local ingredients such as blueberries.

Photos/Paul Leakan



Pinelands Speaker Series Returns

The Commission hosted three educational presentations in 2019 as part of its newly revived Pinelands Speaker Series.

More than 60 people attended the programs, which included presentations on the sights and sounds of the Pinelands, tips on combating climate change with a “Jersey-friendly” yard, and a detailed history of the 18th century Head of the River Cemetery and Church in Estell Manor. The programs were offered to the public at no cost.

The Commission launched the Pinelands Speaker Series in 2006. Presentations were held at the Commission’s headquarters until 2011. Given the opening of the Candace McKee Ashmun Pinelands Education Exhibit, the Commission felt it was the perfect time to revive the educational initiative.



Becky Laboy, an Outreach Specialist for the Ocean County Soil Conservation District, discussed ways to combat climate change in the residential landscape during a talk that was held as part of the Pinelands Speaker Series. Photo/Paul Leakan

The Commission will host the next round of Pinelands Speaker Series presentations in the spring of 2020.



Pinelands National Reserve Calendar

The Pinelands Commission issued its fourth edition of the Pinelands National Reserve wall calendar in November 2019.

The calendar was funded by the Commission, and it features 38 stunning photos that showcase the natural, cultural and historic treasures found in Pinelands National Reserve.

The Commission worked with Rowan College at Burlington County to design and the calendar.

All of the photos were taken by members of the Commission’s staff.

Aside from the photos of the region’s resources, the calendar includes State and Federal holidays, dates of Pinelands Commission meetings and important dates in Pinelands history.

Copies of the calendar were distributed free of charge at Bass River State Forest, the Batsto Visitor Center and Brendan T. Byrne State Forest.

OCTOBER 2020 Above: The white flowers of wild rain in the springtime become berries that change from pink to purple as they ripen in autumn. Photo – John Bunnell

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SEPTEMBER 2019	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Calendar inset: Located in Wharton State Forest, Antrim Lake is a great place to catch a sunset. Photo – Rhonda Ward

On the left: The Pinelands is home to dozens of farmers markets that sell baked goods, cider, flowers and locally grown produce such as apples, blueberries, peaches, tomatoes and pumpkins. Photo – Paul Leakan

NJ.GOV/PINELANDS | NPS.GOV/PINE

Finances

Fiscal & Budget

The Commission's Operating Budget for Fiscal Year 2019 totaled \$5,915,074. Of this, \$4,839,943, or 81% percent, was budgeted for personnel expenses.

Budgeted revenue sources included \$779,708 in federal grants, a \$2,799,000 State appropriation, \$1,133,733 in State grants and other State funding, \$430,000 in application fees and \$772,633 from the Commission's fund balance and reserves.

The 2019 budget for the Kirkwood-Cohansey Study, funded through legislation passed in 2001, was \$115,270. The budget for the Pinelands Conservation Fund was \$863,397.

The Commission's Audit Report for Fiscal Year 2018, which ended June 30, 2018, is posted on the State Auditors web site. The website address is: https://www.njleg.state.nj.us/legislativepub/auditreports_department.asp#PINE.

Pinelands Application Fees

Since April 2004, the Pinelands Commission has received application fees to partially underwrite the direct costs associated with reviewing development applications in the Pinelands Area. During Fiscal Year 2019, unaudited application fee revenues actually collected totaled \$690,000 (\$256,048 more than Fiscal Year 2018).

Certification

As required by State Executive Order #37, all State authorities are required to certify that during the preceding year the authority has, to the best of its knowledge, followed all of the authority's standards, procedures, and internal controls. I hereby certify to the best of my knowledge that, during the 2019 calendar year, all of the Commission's standards, procedures, and internal controls were followed.



Nancy Wittenberg
Executive Director