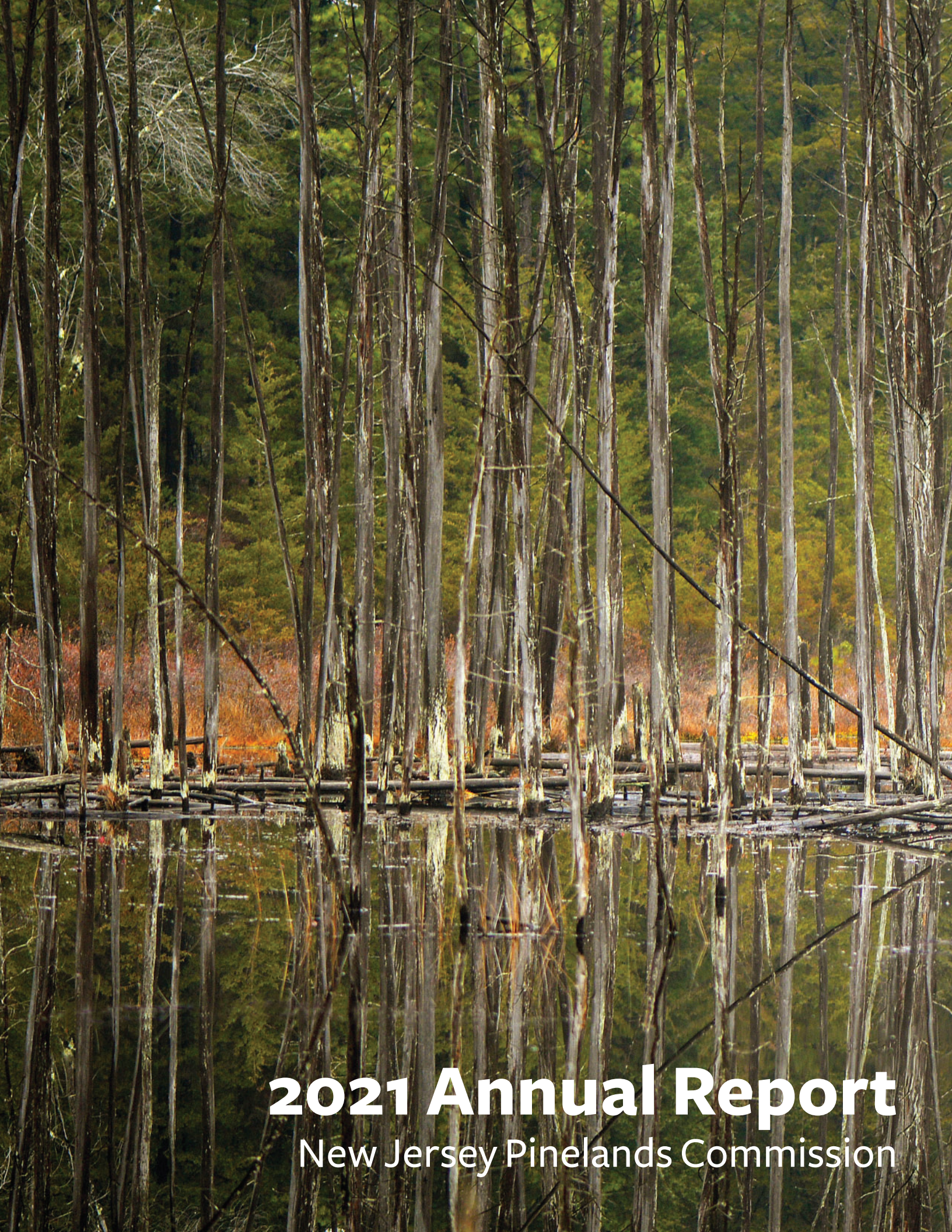


2021 Annual Report

New Jersey Pinelands Commission

Protecting the New Jersey Pinelands

The New Jersey Pinelands Commission is an independent state agency 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.

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

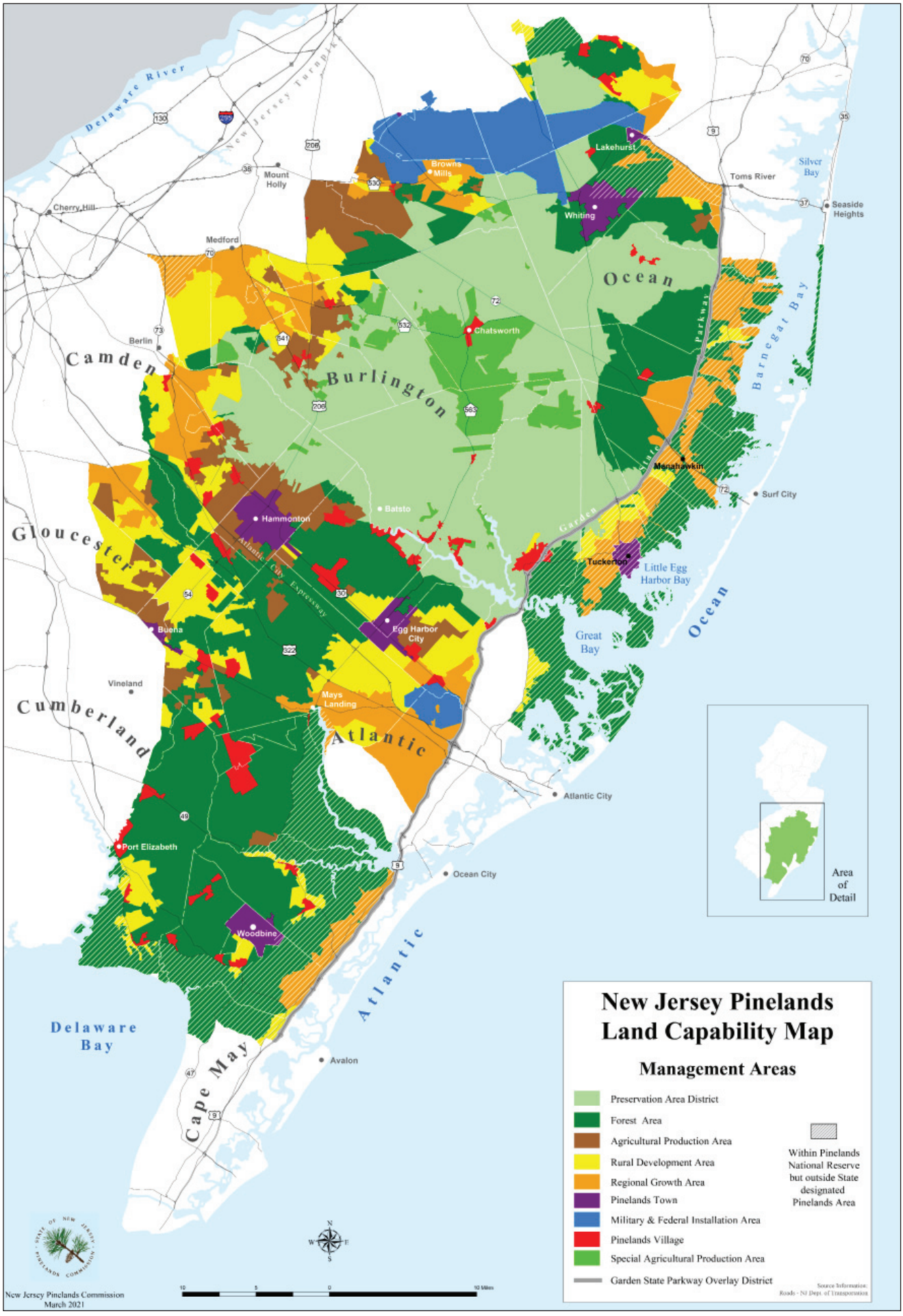
To accomplish its mission, the Commission implements a comprehensive plan that guides land use, development and natural resource protection programs in the 938,000-acre Pinelands Area of southern New Jersey. The Commission's 15-member board consists of state, county and federal appointees who volunteer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

Commissioners:

Richard H. Prickett, Chairman
Alan W. Avery, Jr., Vice Chairman
Daniel Christy
D'Arcy Rohan Green
Shannon Higginbotham
Jordan P. Howell (January - August)
Jerome H. Irick
Jane Jannarone
Edward Lloyd
Mark S. Lohbauer
Jonathan Meade (December)
William Pikolycky
Gary Quinn

Susan R. Grogan, Acting Executive Director

Pinelands Commission
P.O. Box 359
New Lisbon, NJ 08064
Phone: (609) 894-7300
Fax: (609) 894-7330
Website: www.nj.gov/pinelands


New Jersey Pinelands
Land Capability Map
Management Areas
Preservation Area District
Forest Area
Agricultural Production Area
Rural Development Area
Regional Growth Area
Pinelands Town
Military & Federal Installation Area
Pinelands Village
Special Agricultural Production Area
Garden State Parkway Overlay District
Within Pinelands National Reserve but outside State designated Pinelands Area
Area of Detail
Delaware River
Delaware Bay
Atlantic
Ocean
Barnegat Bay
Camden
Burlington
Gloucester
Cumberland
Cape May
Ocean
Lakehurst
Browns Mills
Toms River
Silver Bay
Seaside Heights
Whiting
Medford
Mount Holly
Cherry Hill
Berlin
Chatsworth
Batsto
Hammonton
Tuckerton
Little Egg Harbor Bay
Great Bay
Surf City
Manahawkin
Egg Harbor City
Buena
Vineland
Mays Landing
Atlantic City
Port Elizabeth
Ocean City
Woodbine
Avalon
New Jersey Pinelands Commission
March 2021

Acting Executive Director's Message

The Pinelands Commission faced extraordinary challenges in 2021.

Our Executive Director, Nancy Wittenberg, passed away on June 24th. And there were the difficulties of continuing to undertake our complex and vital work amid the ongoing COVID-19 pandemic.

But the Commission and its staff rose to the occasion, thanks to equal parts dedication, perseverance and creativity.

Above: The sun rising above Wharton State Forest in the Pinelands Area, as photographed in November 2021. Photo/Paul Leakan

After following a hybrid remote schedule for several months, the staff returned to the office on a full-time basis in October. With our offices still closed to the public, we continued to harness the power of technology to accomplish all facets of our work. Development applications and municipal ordinances continue to be received and processed via e-mail. Staff also encouraged the public to use the interactive Pinelands map on our website to help guide development proposals. All of our meetings were held virtually, and we hosted 28 educational webinars and the first-ever, virtual Pinelands Short Course. We made full use of our social media sites, launching a new Twitter page and sharing numerous Instagram posts to raise awareness and appreciation for the Pinelands.

Our staff continued to conduct site visits for development proposals and complete the fieldwork necessary to gather data and carry out numerous scientific research projects.

The Commission also took important steps to better protect Pinelands resources and help address the impacts of climate change. In November, the Commission authorized the participation of four new advanced wastewater technologies in the agency's Alternate Design Treatment Systems Pilot Program. The program tests high-performance wastewater treatment systems that better protect the Pinelands environment by reducing the levels of nitrogen that enter groundwater. In December, the Commission adopted new rules that require the use of green infrastructure and other more stringent standards to manage stormwater. Meanwhile, the Pinelands Climate Committee met seven times in 2021, hosting presentations from a variety of experts and laying the foundation for future decisions aimed at mitigating climate change impacts.

Meanwhile, the Commission continued to administer the increasingly active Pinelands Development Credit Program and successfully garnered the National Scenic Byway designation for the Pine Barrens Byway.

In the midst of these challenges, we found time to celebrate the 40th anniversary of the Pinelands Comprehensive Management Plan.

I am proud of all that was accomplished in 2021, despite the challenges. I am also confident about our ability to continue to preserve, protect and enhance this special part of New Jersey.

Susan R. Grogan
Acting Executive Director

In Memoriam: Nancy Wittenberg and Jay Mounier

2021 was a difficult year for the Pinelands Commission, as the agency's mourned the passing of Executive Director Nancy Wittenberg and former Commissioner Jay Mounier.

Ms. Wittenberg passed away on June 24th, while Mr. Mounier died on November 24th.

"Nancy had a long and accomplished career in public service," said Commission Vice Chairman Alan W. Avery, Jr. "Her leadership and personal commitment as Executive Director have left the Commission and its staff in a strong position to continue the Commission's mission to protect and manage the Pinelands."

Above: Nancy Wittenberg, pictured on the right, had served as the Commission's Executive Director since January 3, 2011. She passed away on June 24, 2021. Photo/Paul Leakan

Ms. Wittenberg had served as the Commission's Executive Director since January 3, 2011. During her tenure, the Commission:

■ Completed an in-depth review of the Pinelands Comprehensive Management Plan (CMP), which contains the rules that govern land-use, development and the protection of resources in the Pinelands. This included the formation of a Plan Review Committee that gathered comments from the public and provided a forum for discussing measures aimed at strengthening the CMP. It also included the issuance of a 183-page report that includes recommendations for future changes to the Plan;

■ Adopted five sets of amendments to the Pinelands Comprehensive Management Plan;

■ Permanently preserved approximately 8,300 acres of land in the Pinelands by providing grants through the Commission's Pinelands Conservation Fund;

■ Formed several Committees to address important topics, such as climate change, agriculture and the agency's process to consider Memorandums of Agreement;

■ Undertook several initiatives aimed at curbing the damages wrought by illegal, off-road vehicle use, including the adoption of a resolution pertaining to roads for motor vehicle use in Wharton State Forest and helping to identify ponds that are vulnerable to damages and have been protected through the installation of wooden barriers;

■ Successfully completed a report that enabled the Pinelands National Reserve to maintain its status as an International Biosphere Region, as designated by United Nations Educational, Scientific and Cultural Organization (UNESCO);

■ Assumed the administration of the Pinelands Development Credit Bank, which is the processing agency for one of the oldest and most successful transfer of development rights programs in the world;

■ Completed and/or launched numerous scientific studies, including several ongoing research projects on rare snakes;

■ Installed, dedicated and opened the Candace McKee Ashmun Pinelands Education Exhibit, which features more than 400 square feet of displays that will be used to raise awareness and appreciation of the Pinelands for decades to come; and

■ Overhauled the agency's website so that is easier to navigate and to provide the public with far greater access to Commission documents, such as resolutions, meeting minutes, development application information, and links to livestreamed Commission meetings.

Mr. Mounier was a longtime resident of Franklin Township in Gloucester County, and he served as a gubernatorial appointee on the Commission from January 1995 to December 2002. He was a member of the Pinelands Agricultural Advisory Committee and served as its Chairman from 2000-2002. He was also a mainstay at Commission meetings for nearly two decades after his term as a Commissioner ended.

Mr. Mounier operated a hay and livestock farm in Franklinville. He previously served on the Franklin Township Environmental Commission and the Franklin Township Planning Board. Mr. Mounier also served as a Trustee and Treasurer of the South Jersey Land Trust, and he was a founding member of the South Jersey Astronomy Club and the Upper Maurice River Watershed Association. He was a hobbyist beekeeper and was the former President of the South Jersey Beekeepers Association. He held a degree in mechanical engineering from Lehigh University.

Above: The late John C. Stokes (left), who served as the Commission's Executive Director from April 2003 to January 2011, shakes hands with the late Jay Mounier.

Mr. Mounier's colleagues said he was a highly intelligent and effective voice for agriculture in the Pinelands.

"He was a true friend of agriculture and the Pinelands," said Paul E. Galletta, who served on the Pinelands Commission from 2007 to 2019. "He was deeply concerned with the protection of both. He was a personal friend and one of the smartest men I ever met in my life. He was almost encyclopedic with almost any topic you could recite. I believe not only the Pinelands and the agricultural community will miss him deeply, but a lot of friends also."

"I was most impressed over the years with his incredible intellect and patience to read the volume of material that we received (as Commissioners)," said Stephen V. Lee III, who served on the Commission from 1982 to 2010. "… I could always count on Jay for finding something in the record that might be worth raising a question (about) at a Commission meeting."

Celebrating 40 Years of the Pinelands Comprehensive Management Plan

The Pinelands Comprehensive Management Plan (or CMP) turned 40 on January 14, 2021, and the Commission marked the milestone by creating and sharing videos, informative social media posts and informative e-mails each day for more than three months.

The celebration kicked off with a "Roundtable Reflection" video that featured a discussion with Commission members and staff who wrote, adopted or implemented the CMP, which guides land-use, development and the protection of resources in the state Pinelands Area. The nine participants reflected on their experiences in writing the 500-page plan amid a daunting deadline and without the benefit of computers or mapping programs. The information campaign continued with individual video interviews of former Commissioners and staff. The video interviews have been archived on the Commission's YouTube Channel (https://www.youtube.com/channel/UCBgpC8sbR3Acrjo7ppxs3Uw).

Staff researched, wrote and shared 125 posts on the agency's Instagram site, Facebook page and through the agency's Pinelands News Alert e-mail mailing list on 60 consecutive workdays, along with 463 photos and 26 videos, as part of the celebration. The videos and the posts chart the history, purpose, implementation and success of the CMP, and they include spotlights on all nine Pinelands Management Areas, plant and animal species that benefit from Pinelands protection, the Pinelands Development Credit program, and the Pinelands Conservation Fund, as well as features on the work of the agency's Planning, Regulatory Programs, Science and Communications offices.

The information campaign concluded with a newly created, 40-minute video of various footage that staff has filmed in the Pinelands in recent years.

Above: Two former Commissioners and seven former Commission staff members who wrote the Pinelands CMP 40 years ago participated in a virtual "Roundtable Reflection" on the success of the plan as part of a months-long celebration.

Planning Activities

Amendments to the Pinelands Comprehensive Management Plan

In 2021, the Commission adopted new rules that will better protect Pinelands resources by requiring the use of green infrastructure and other more stringent standards to manage stormwater.

During its meeting of December 10, 2021, the Commission voted unanimously to adopt the amendments to the Pinelands CMP, the rules that govern land-use, development, and the protection of resources in the state Pinelands Area.

The amendments integrate and expand on stormwater management rules that were adopted by the New Jersey Department of Environmental Protection (NJDEP). The NJDEP's regulations took effect on March 2, 2020, and they focus on the use of green infrastructure to meet groundwater recharge and stormwater runoff quantity and quality standards.

Stormwater runoff is managed to reduce waterborne pollution from sources such as trash, nitrogen, phosphorus, bacterial pathogens and deicing salts, and to minimize local flooding.

Above: This rain garden that was installed at the Hammonton Lake Park is an example of a green infrastructure measure that will be required for minor development under the Commission's new rules. Photo/Paul Leakan

The Commission's new stormwater management rules follow the NJDEP's regulations in that they require green infrastructure to manage the stormwater close to the source, treat stormwater through infiltration into the subsoil, treat stormwater through filtration by vegetation or soil, and/or store stormwater runoff for reuse.

In order to provide enhanced protection to Pinelands resources, the Commission's new rules will, for the first time, require stormwater management for minor development. Minor residential development will be required to retain and infiltrate clean stormwater generated from the roof of a house by using green infrastructure measures, which include dry wells, pervious paving systems and small-scale bioretention systems such as a rain garden. Minor non-residential development will be required to treat, infiltrate and recharge stormwater generated from new motor vehicle surfaces of greater than 1,000 square feet in size.

Prior to the new rules, stormwater management in the Pinelands Area was generally required only for major development, defined in the CMP as any division of land into five or more lots; any construction or expansion of any housing development of five or more dwelling units; any construction or expansion of any commercial or industrial use or structure on a site of more than three acres; or any grading, clearing or disturbance of an area in excess of 5,000 square feet.

The new CMP amendments also include stricter standards for nitrogen removal for major development in the

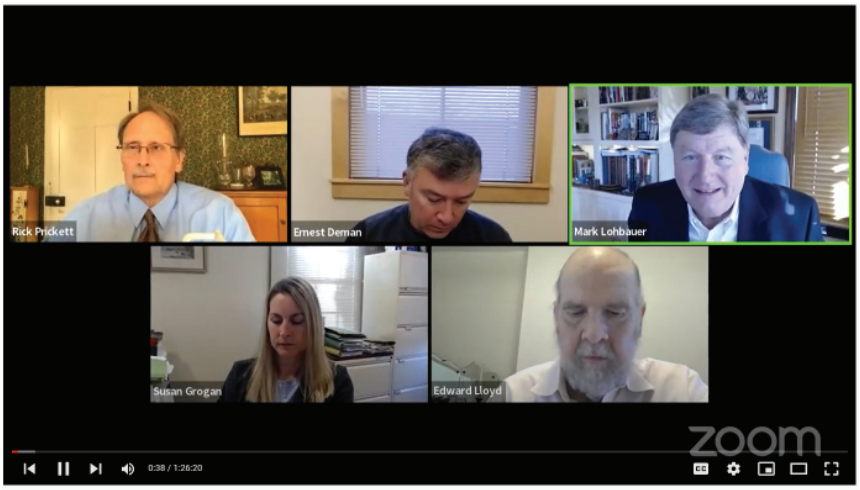
Pinelands. The new rules require all major development to implement stormwater management measures to achieve a minimum 65% reduction of total nitrogen loads in stormwater runoff. The Pinelands' ecosystem is particularly vulnerable to damages caused by elevated levels of nitrogen, including the proliferation of invasive plant and animal species that outcompete and displace native species that are adapted to low levels of nitrogen. Lastly, the new rules clarify standards for variances, exceptions, and mitigation.

The new regulations build on the significant improvements made by the NJDEP with respect to the use of green infrastructure and include additional measures that afford enhanced protection of Pinelands resources and address the impacts of climate change on stormwater runoff. The Commission's new rules will reduce the volume of stormwater runoff, lower the potential for localized flooding and help to maintain water levels in the Kirkwood-Cohansey aquifer, which underlies the Pinelands, provides fresh drinking water and supports the region's special ecosystem.

The new stormwater management rules took effect after they were published in the New Jersey Register on January 18, 2022. Pinelands municipalities have one year to incorporate the new rules into their own master plans and land use ordinances. In 2022, the Commission will draft and provide model ordinances to assist the municipalities with that effort.

Pinelands Climate Committee

In 2021, the Commission's Pinelands Climate Committee continued to discuss and chart the agency's future efforts to address climate change.



Pinelands Climate Committee Meeting -- December 1, 2021

The seven-member Committee has been discussing the potential effects of climate change in the Pinelands and considering measures to mitigate impacts since its formation in 2019. The Committee met seven times in 2021.

During its meeting in January, staff delivered a presentation on solar energy facilities, focusing on the New Jersey Board of Public Utilities (NJBPU) Community Solar Pilot Program, current Pinelands CMP standards, recent development applications and possible amendments for the Committee's consideration. Staff also provided an update on the NJDEP's ongoing NJPACT (Protecting Against Climate Threats) regulatory reform effort. Staff also displayed a series of maps prepared using NJ FloodMapper tools to show the potential impacts of sea level rise on the Pinelands Area.

The Committee hosted presentations on forest management during its March meeting. The presentations were delivered by Leslie Sauer, author, founder of Andropogon Associates and founding board member of the Northeast Region of the Society for Ecological Restoration, and John Cecil, Vice President for Stewardship, NJ Audubon Society.

During its meeting in May, the Committee received a brief update on the status of forestry-related bills that were pending in the State legislature. The Committee discussed potential amendments to the CMP's solar energy facility standards, focusing primarily on facilities located at existing landfills and resource extraction operations.

The Committee also discussed possible operational improvements that could be made at the Commission's offices.

In July, the Committee hosted a presentation on forest carbon and climate information. The presentation was delivered by Bernard Isaacson, Courtney Compton, Lauren Gazerwitz and Bill Zipse from the New Jersey Forest Service.

During its meeting in September, staff provided information on the Local Government Energy Audit program offered by the NJBPU. Staff also provided an update on the NJDEP's PACT (Protecting Against Climate Threats) and REAL (Resilient Environments and Landscapes) rulemaking initiatives.

During its December meeting, the Committee received updates from the staff about two FY2022 initiatives: the design and installation of a rain garden at the Commission's office and the submission of an application to the NJBPU for a local government energy audit of the agency's offices. Lastly, the Committee agreed to consider a resolution specifically addressing the goals of the New Jersey Global Warming Response Act, measures to avoid or minimize greenhouse gas emissions at the Commission's own offices and the future development of specific CMP standards.

Alternate Design Wastewater Treatment Systems Pilot Program

During its meeting on November 12, 2021, the Commission adopted a resolution that authorizes the participation of four new advanced wastewater technologies in the agency's Alternate Design Treatment Systems Pilot Program.

The Commission launched the Pilot Program in 2002 to test high-performance wastewater treatment systems that better protect the Pinelands environment by reducing the levels of nitrogen that enter groundwater.

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. To date, more than 422 Pilot Program systems have been installed to service single-family residential development in 28 Pinelands municipalities.

In 2020, the Commission adopted amendments to the CMP that extended the pilot program through 2025, authorized the use of one system technology, SeptiTech, for residential development on minimum one-acre parcels on a permanent basis, removed two systems from the program (one that has not been installed in the Pinelands and the other that has not met standards), and enabled the Commission to add additional technologies to the program by recruiting new NSF Standard 245 and/or USEPA ETV certified technologies to participate.

Under the resolution adopted by the Commission in November 2021, the Fuji Clean USA Residential CEN Series system, the Waterloo Biofilter Residential Model system and the Busse Innovative Systeme Model MF-B-400 system will be permitted to serve residential development on minimum one-acre parcels, and the Pugo system will be permitted to serve residential development on minimum 1.26-acre parcels.

Above: The housing development above was built with an alternate design wastewater treatment system in the Pinelands Area of Tabernacle Township. Photo/Paul Leakan

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.

Above: This 700-acre blueberry and cranberry farm in Tabernacle Township's Special Agricultural Production Area has been permanently preserved through the Pinelands Development Credit program. Photo/Paul Leakan

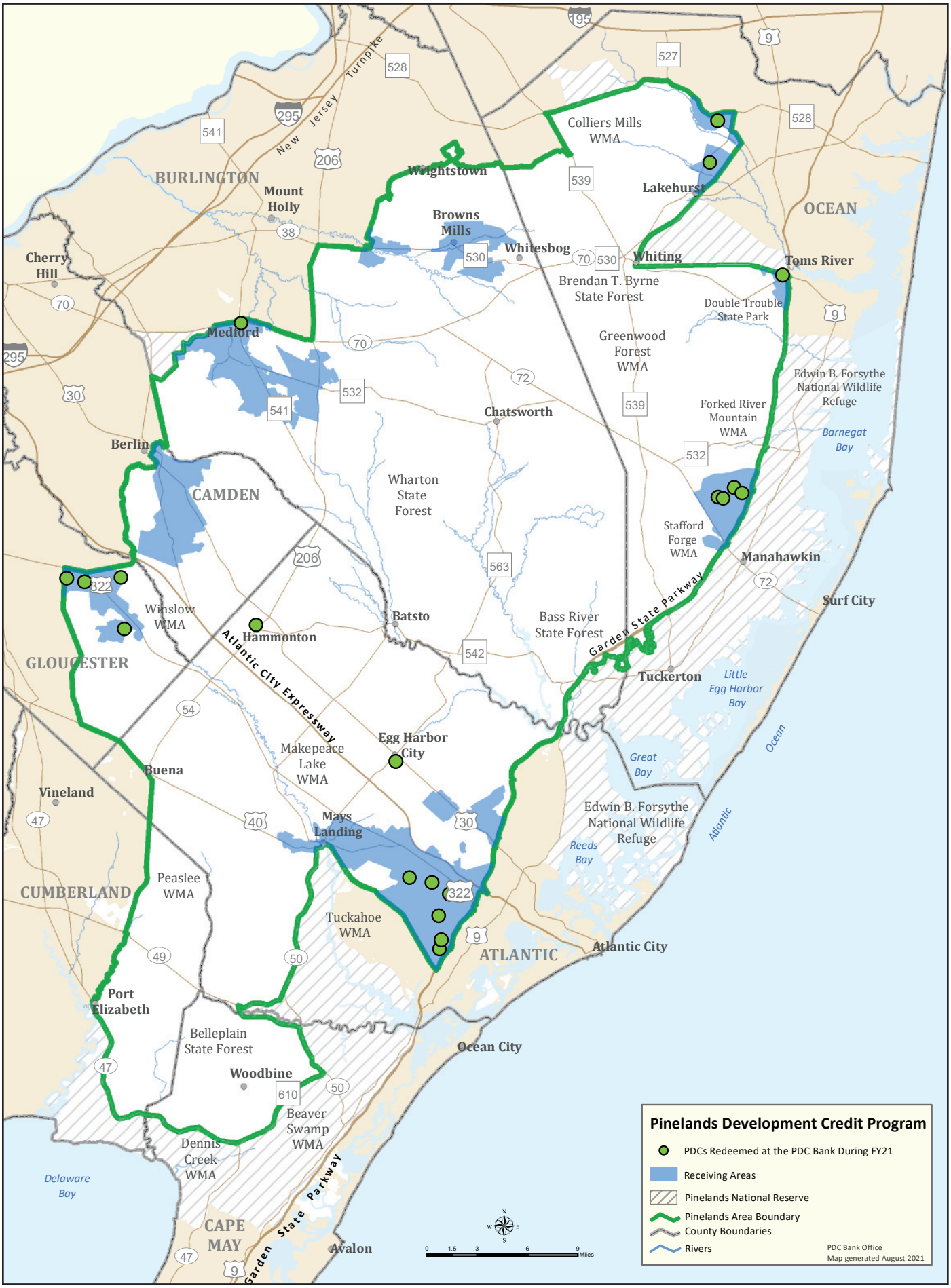
Once PDCs are "severed" from a sending area property, the property is permanently protected by a conservation or agricultural deed restriction and the PDCs allocated to that property can be sold on the private market.

During 2021, 72.70 PDCs were allocated by the Commission to 36 sending area properties. A total of 53.00 PDCs were severed, protecting 1,705 acres of land in the Special Agricultural Production Area in Bass River Township and the Agricultural Production Area in Franklin and Monroe Townships. Since 1982, 57,147 acres in the Pinelands Area have been permanently preserved through the PDC Program.

In 2021, a total of 31.25 PDCs were sold, with an average sales price of $57,752 per PDC. This represents a significant increase ($13,000) over the average sales price in 2020. A total of 60.00 PDCs were redeemed for a wide variety of residential projects in Barnegat, Egg Harbor, Jackson, Medford, Monroe, Shamong and Stafford townships, the Town of Hammonton and the Borough of South Toms River during 2021.

Please see page 11 for a map that illustrates all PDC redemptions that occurred during Fiscal Year 2021.

Above: Prospective buyers can tour a model cottage at The Cottages at Compass Point, a development that will include 212 single-family detached homes and a 13,500-square-foot clubhouse in Barnegat Township's Regional Growth Area and required the use of 16 Pinelands Development Credits (or 64 rights). Photo/Paul Leakan


BURLINGTON
Mount Holly
Cherry Hill
Medford
Berlin
CAMDEN
GLOUCESTER
Winslow WMA
Hammonton
Atlantic City Expressway
Buena
Vineland
Makepeace Lake WMA
Egg Harbor City
Mays Landing
Peaslee WMA
CUMBERLAND
Tuckahoe WMA
Port Elizabeth
Belleplain State Forest
Woodbine
Dennis Creek WMA
Beaver Swamp WMA
Delaware Bay
CAPE MAY
Garden State Parkway
Avalon
Ocean City
ATLANTIC
Atlantic City
Wharton State Forest
Batsto
Chatsworth
Wrightstown
Browns Mills
Whitesbog
Colliers Mills WMA
Lakehurst
OCEAN
Toms River
Whiting
Brendan T. Byrne State Forest
Double Trouble State Park
Greenwood Forest WMA
Forked River Mountain WMA
Edwin B. Forsythe National Wildlife Refuge
Barnegat Bay
Stafford Forge WMA
Manahawkin
Surf City
Bass River State Forest
Tuckerton
Little Egg Harbor Bay
Great Bay
Ocean
Atlantic
Reeds Bay
Edwin B. Forsythe National Wildlife Refuge
New Jersey Turnpike
Garden State Parkway
Pinelands Development Credit Program
PDCs Redeemed at the PDC Bank During FY21
Receiving Areas
Pinelands National Reserve
Pinelands Area Boundary
County Boundaries
Rivers
PDC Bank Office
Map generated August 2021
0 1.5 3 6 9 Miles

Reviewing Municipal Ordinances

The master plans and land use ordinances of all Pinelands municipalities and counties must be consistent with the Pinelands 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.

The Commission received and reviewed 155 municipal master plan and ordinance amendments in 2021. The Commission continued to see a trend of municipalities adopting plans regulating land uses in areas deemed in need of redevelopment. The Commission received 18 ordinances either adopting or amending redevelopment plans in 2021. Several plans were adopted to facilitate the development of solar energy on closed landfills.

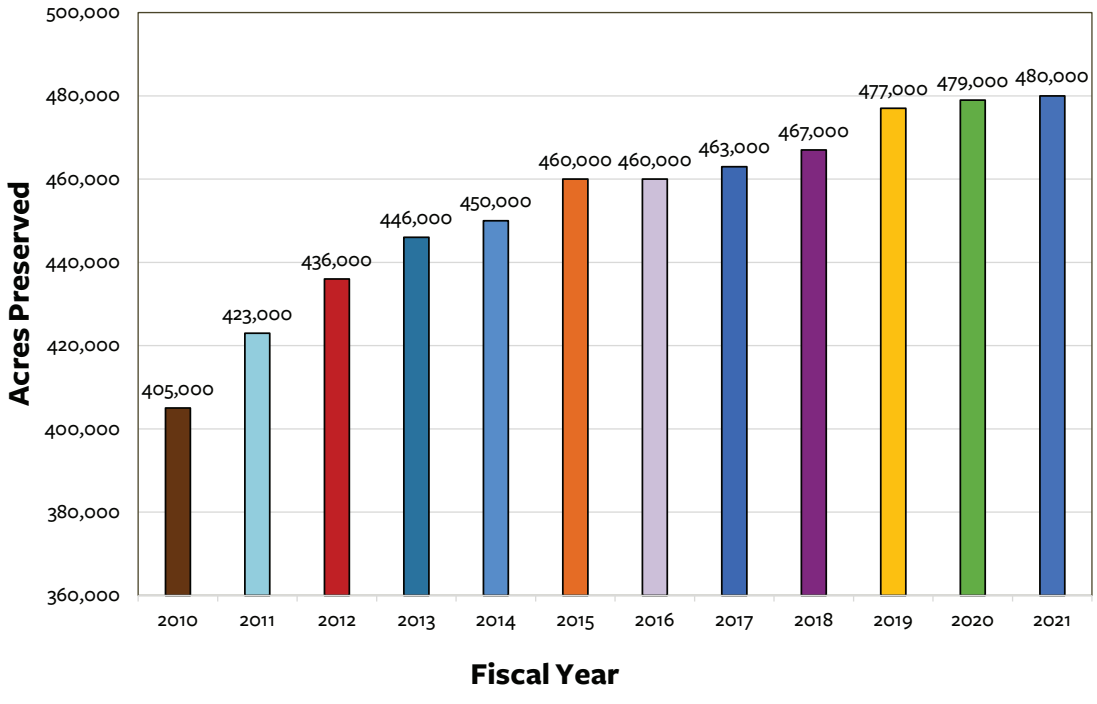
The Commission also received ordinances from nearly all of the 53 Pinelands municipalities regulating the various types of cannabis-related establishments.

Annual Update on Permanent Land Protection in the Pinelands

The Pinelands Commission's staff delivered its annual update on permanent land protection in the Pinelands on September 10, 2021.

A total of 1,529 acres of land were preserved in the Pinelands Area from June 2020 to June 2021. Of that total, 559 acres were preserved through the Pinelands Development Credit Program and an additional 111 acres were preserved through the development application process to meet various CMP standards.

As of June 2021, 51% (480,500 acres) of the state Pinelands Area has been permanently preserved through a variety of programs. Of that total, 94% of the land is located in Pinelands Management Areas that are designated for conservation, including the Preservation Area District, the Forest Area, the Special Agricultural Production Area, and the Agricultural Production Area.



Pine Barrens Byway Designated as a National Scenic Byway

The Pine Barrens Byway was officially designated as a National Scenic Byway in February 2021, thanks to the efforts of the Pinelands Commission.

The Commission is overseeing the administration of the 130-mile byway route, and it prepared the successful application to obtain the National Scenic Byway designation in June 2020.

A total of 63 nomination applications were submitted to the Federal Highways Administration in 2020, and 49 byways in 28 states were successful in receiving designations, including 34 National Scenic Byways and 15 All-American Roads, according to the U.S. Department of Transportation (U.S. DOT). The U.S. DOT took into account evidence of intrinsic quality(s), a demonstration of national or regional significance, the overall visitors' experience, and a demonstration of long-term sustainability.

The Pine Barrens Byway traverses roadways in Atlantic, Burlington, Cape May, Cumberland and Ocean counties, offering a diverse route punctuated by picturesque parks, serene rivers and quaint towns. It is one of eight state-designated scenic byways in New Jersey, and it meanders through Bass River Township, Corbin City, Dennis Township, Egg Harbor City, Estell Manor City, Galloway Township, Hamilton Township, Little Egg Harbor Township, Maurice River Township, Mullica Township, Port Republic City, Tuckerton Borough, Upper Township, Washington Township (Burlington County), Weymouth Township and Woodbine Borough. It was designated as a State Scenic Byway in 2005.

The National Scenic Byway designation bestows prestige and national and international recognition to the area, and it enhances efforts to preserve the Pinelands by increasing awareness and encouraging the stewardship of the region's resources. The national designation could also provide an economic boost to local Pinelands communities through increased tourism and federal funding for projects that promote the Byway.

Above: The Eldora Nature Preserve in Cumberland County is one of many natural, scenic destinations located along the Pine Barrens Byway. Photo/Paul Leakan

In addition to submitting the successful application to the Federal Highways Administration, the Commission has completed numerous projects that raise awareness of the Pine Barrens Byway. In 2020, the Commission created, printed and distributed 650 copies of a 2021 Pine Barrens Byway-themed wall calendar that features 38 photos of various locations along the Byway route. In 2021, the Commission began overseeing a new Byway webpage that was created by consultants hired by the New Jersey Department of Transportation. The Commission also helped to develop and then printed and distributed thousands of copies of two new brochures that will also help to heighten awareness and generate more interest in the Byway. The brochures are available at various locations along the Byway.

The Commission's work on the Byway was funded by the National Park Service through the Long Term Economic Monitoring Program.

Regulatory Activities

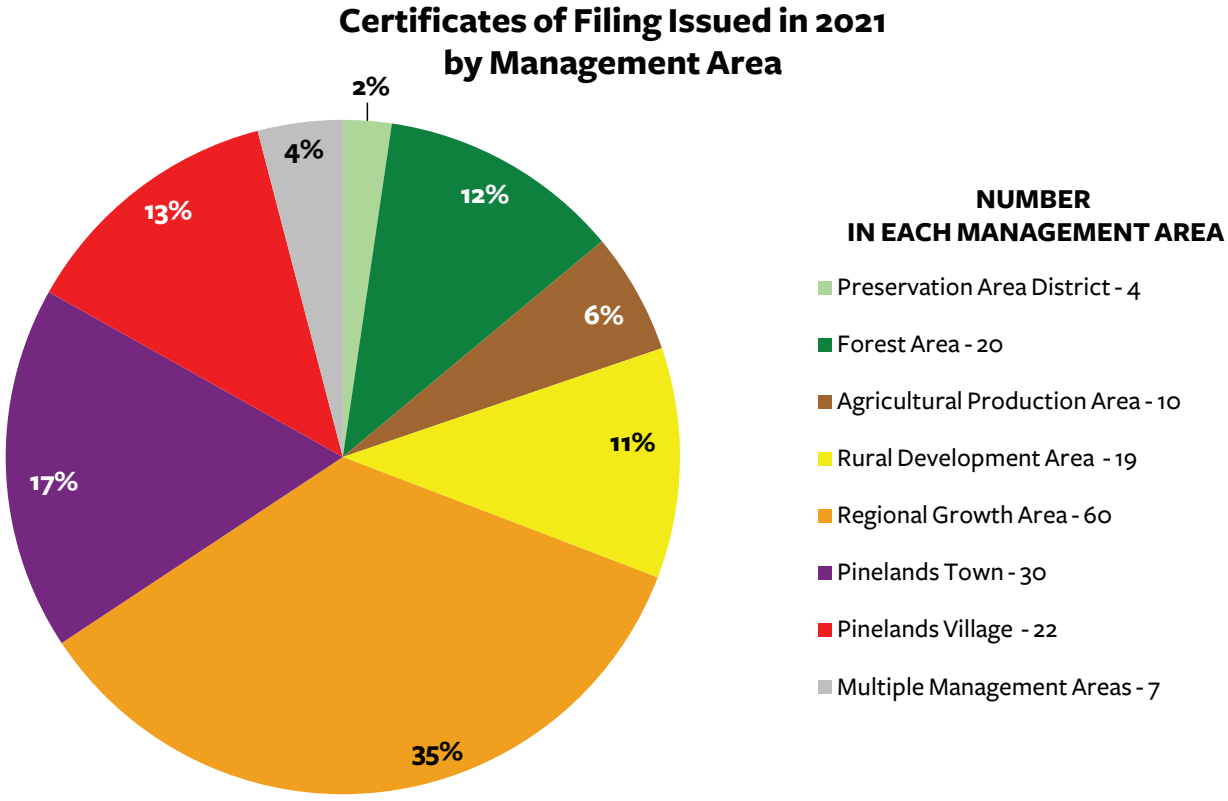
Applications

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

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.

The Commission issued 172 Certificates of Filing (CFs) in 2021, most of which (60) were for proposed development in Regional Growth Areas (as shown in the chart below). There are 24 municipalities with Regional Growth Areas, or RGAs, in the 938,000-acre state Pinelands Area. RGAs make up 8% of the land in the Pinelands Area, and they are generally located on the fringes of the Pinelands boundary. The RGAs include areas of existing development and adjacent lands that have the infrastructure such as sewers, roads and other utilities needed to accommodate new development while protecting the essential character and environment of the Pinelands. The Pinelands Comprehensive Management Plan encourages future growth in the RGAs as a way to prevent scattered and piecemeal development in other more sensitive portions of the Pinelands Area.

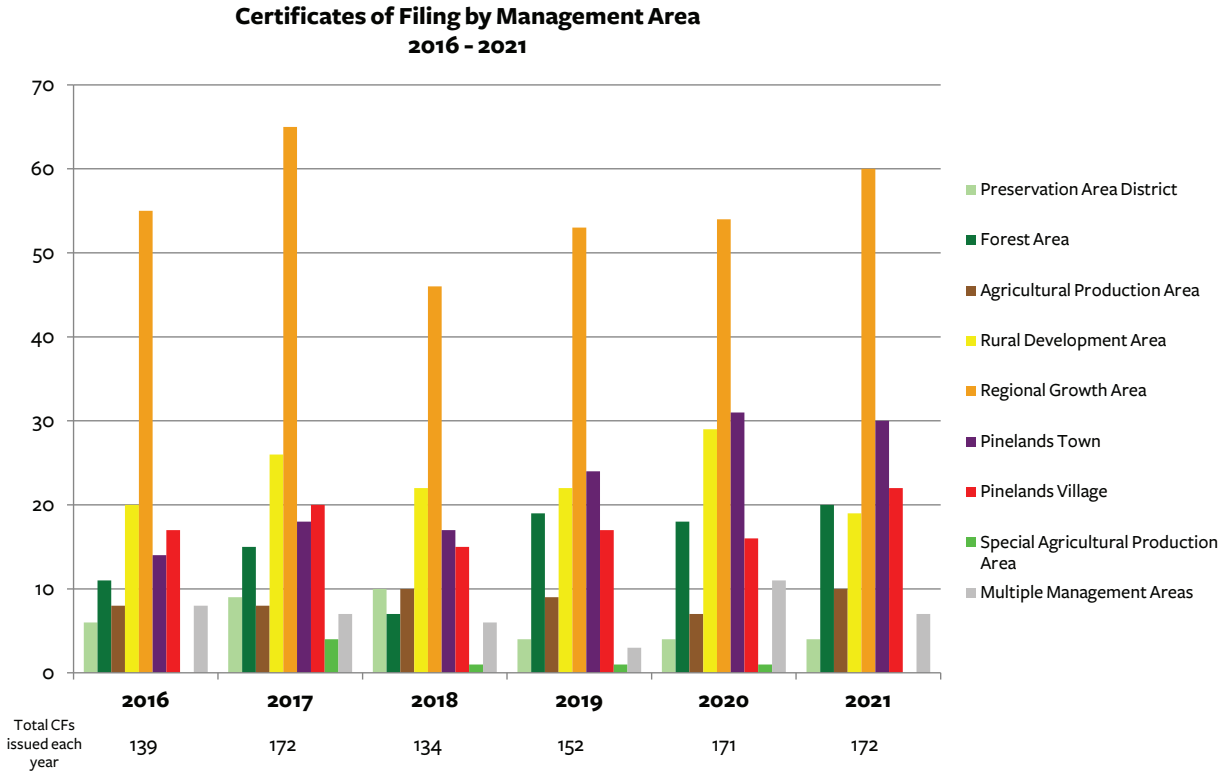


Of the 172 CFs that were issued in 2021, most involved proposals for residential development, followed by commercial development (as shown in the table below).

Certificates of Filing Issued in 2021 by Management Area and Type of Development

Management Areas	Commercial	Infrastructure	Institutional	Recreation	Residential	Resource Extraction	**Total**
Agricultural Production Area	3				7		**10**
Forest Area	4	1	2	1	11	1	**20**
Multiple Management Areas	3	2			1	1	**7**
Pinelands Town	7				23		**30**
Pinelands Village	3		1		18		**22**
Preservation Area District		1			1	2	**4**
Regional Growth Area	17	1			42		**60**
Rural Development Area	4	1			9	5	**19**
Totals	**41**	**6**	**3**	**1**	**112**	**9**	**172**

The Commission issued similar numbers of CFs from 2016 to 2021, with the majority of the proposals for development located in RGAs (as shown on the bar graph below).



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 21 applications for public development in 2021. Examples included the installation of a 10,800-square-foot geothermal well field for the heating and cooling of the Batsto Visitors Center and the installation of 5.35 acres of ground-mounted solar energy facilities at the Hammonton High School and Hammonton Early Childhood Center.

Recreation Permits

In 2021, the Commission issued seven 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.

Development Application Trends in 2021

The Commission saw increased interest and activity in three new types of development proposals in 2021: cannabis-related facilities, community solar facilities on existing landfills and large warehouses.

On February 22, 2021, the New Jersey Cannabis Regulatory, Enforcement Assistance, and Marketplace Modernization Act (P.L. 2021, c. 16) was signed into law by Governor Murphy. The law legalizes the sale and use of cannabis and cannabis-related products for recreational use by adults in the State.

The law provides municipalities with the option to enact ordinances to govern the number, type and operations of cannabis businesses within their borders. The law also permitted municipalities to adopt ordinances prohibiting the establishment of certain classes of cannabis businesses, provided such ordinances were adopted prior to August 21, 2021. For those municipalities located within the Pinelands Area, such ordinances must also be in conformance with the Pinelands CMP and certified by the Commission before they may go into effect.

In response to this law, the Commission received numerous inquiries regarding cannabis-related cultivation, processing/manufacturing, sale and distribution for both recreational and medical cannabis uses. Two development applications were submitted for cannabis related facilities: a cannabis cultivation/processing facility in Winslow Township and a medical cannabis dispensary facility in Hamilton Township.

In addition to numerous phone calls, the Commission received written inquiries or application material on 27 different solar projects in 2021. Most likely in response to the New Jersey Board of Public Utilities (NJBPU) Community Solar Energy Pilot Program, the Commission received several joint proposals from municipalities and solar energy providers to formally close existing landfills and install solar energy facilities on the closed landfills. In 2021, the Commission received six proposals for the development of solar energy facilities as a principal use in conjunction with the proposed closure of existing landfills. Of those six proposals, one application was completed in the Borough of Woodbine.

Lastly, 2021 saw increased interest in the siting and development of large warehouses in the Pinelands Area. The Commission received numerous inquiries and new applications in 2021 for warehouses ranging in size from 50,000 square feet to over 1,000,000 square feet.

Science & Research Activities

Long-term Environmental Monitoring Program

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.

Above: The soft and crusty brown blotches on this northern pine snake indicate potential snake fungal disease infection. Photo/John Bunnell

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 new 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.

To determine if *O. ophiodiicola* was present in the dens or on hibernating snakes, initial sampling was completed in 2018 during den excavations at three locations. Because the initial sampling 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 at all four of Dr. Burger and Mr. Zappalorti's study sites. 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 were swabbed 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. In 2021, all hibernating snakes were swabbed again to document changes in fungal infection for individual snakes over time and investigate changes in snake fungal disease among dens. Results assessing the presence of *O. ophiodiicola* in dens versus adjacent soils and examining factors associated with the growth of the fungus, were recently published in the Journal of Fungi (Campbell, L.J.; Burger, J.; Zappalorti, R.T.; Bunnell, J.F.; Winzeler, M.E.; Taylor, D.R.; Lorch, J.M. Soil reservoir dynamics of *Ophidiomyces ophidiicola*, the causative agent of snake fungal disease. Journal of Fungi 2021, 7, 461).

Rare Snake Population Monitoring: Aside from the long-term artificial den excavations mentioned in the Snake Fungal Disease Monitoring component, no long-term data exist to assess rare snake population trends in the Pinelands. Therefore, we are establishing a network of natural snake dens, shed areas, and nest sites to monitor long-term population changes in several species of rare snakes. As part of ongoing snake studies,

numerous winter dens have been identified for corn snakes and kingsnakes. The goal is to identify more natural pine snake dens and natural dens for other rare snake species. Beginning in 2018, corrals were built around most dens to capture snakes as they enter hibernation in the fall and emerge from hibernation in the spring. The den corrals offer an effective non-invasive method to census snakes each fall and spring without physically disturbing dens or hibernating snakes.

In 2021, additional corn snake and pine snake dens were corralled prior to snake emergence in spring. A total of 24 corn snakes and nine pine snakes were radiotracked during the field season to find new dens, shed sites, and nest areas. Potential dens observed by tracking these snakes will be corralled during the winter of 2021-2022 and productive dens will be incorporated into the monitoring program. Over the course of the year, 314 new and previously PIT tagged snakes were found. These include 181 corn snakes, 75 pine snakes, 41 kingsnakes, 40 black racers, and 25 snakes of several other species (garter snakes, scarlet snakes, hognose snakes, rough green snakes, and timber rattlesnakes). In addition to the new and previously PIT tagged snakes, 96 corn snakes, 49 pine snakes, and 16 kingsnakes were hatched in the lab from eggs collected from gravid females and these hatchlings were also tagged and released.

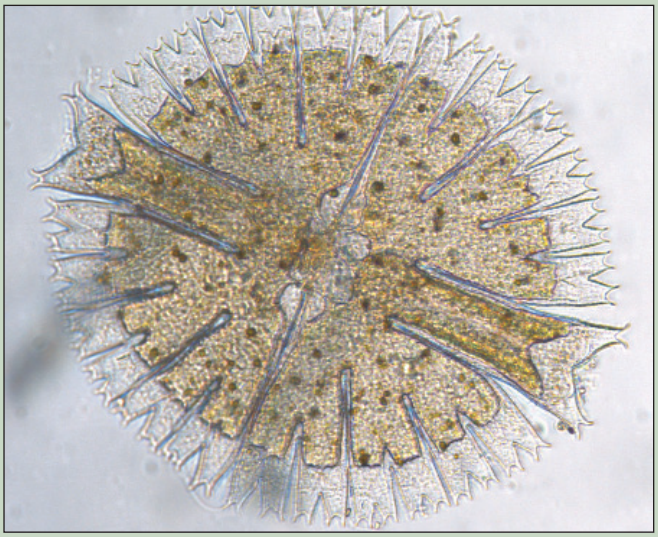
Other 2021 environmental monitoring activities included surveying calling frogs and toads at a group of ponds that are surveyed annually, measuring bimonthly water quality at 47 stream sites, recording monthly water levels at 35 forest plots and 30 ponds, and maintaining continuous water-level recorders installed in seven other ponds and in a shallow observation well installed within a pine lowland forest.

Long-term environmental monitoring research is being funded by the National Park Service.

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 goals of the Microorganism Study are to assess the relationship between surrounding land use and various water-quality and biological attributes and to compare the plants and animals from these natural and created wetlands. Over a three-year period, from 2018 to 2020, field work was conducted at the 60 wetlands. Commission scientists and collaborators with the N.J. Department of Environmental Protection (NJDEP) and USGS 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).

In 2021, taxonomic consultants completed processing and identifying zooplankton, algae, diatoms, and macroinvertebrates that were collected from the study sites. Project scientists assembled the biological and water quality data collected from the 60 wetlands and began analyzing the data and preparing a final report.



Above: Micrasterias rotata is one of 162 free-floating algae species that were collected at 60 wetland sites during the study. Photo/EcoAnalysts, Inc.

Endocrine Disruption Study

The William Penn Foundation is funding scientific research in the Delaware River Watershed through the Delaware Watershed Research Fund, which is administered by The Academy of Natural Sciences. The Kirkwood-Cohansey aquifer, which underlies the Pinelands, was identified as one of the research areas eligible for funding. Commission scientists and USGS 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 study was awarded funding in 2016.

Above: Non-native black crappie was one of the fish species sampled for evidence of endocrine disrupting chemicals at lakes upstream and downstream of a sewage treatment plant.

Photo/ John Bunnell

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, and pesticides. Endocrine disrupting chemicals, or EDCs, are a global environmental problem and have been linked to reproductive and developmental abnormalities in a variety of animal species, especially fish and amphibians.

Commission and USGS scientists proposed to 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 and 2020, fish were collected from stream sites above and below sewage treatment plants for histological analysis by USGS scientists. Although field work for the project was completed in 2020, factors related to the pandemic caused significant delays in laboratory processing. In 2021, data collected in the study were published by the U.S. Geological Survey (Breitmeyer, S.E., Walsh, H.L., Smalling, K.L., Blazer, V.S., Boetsma, A.C., Carper, L.G., Cohl, J.A., Dietze, J.E., Iwanowicz, L.R., Lane, R.F., Raines, C.D., Schreiner, M.L., Tush, D.L., Wilson, M.C., Sperry, A.J., Bunnell, J.F., Burritt, P.M., and Dragon, J., 2021, Organic and inorganic constituents in surface water and native and non-native fish and frog health data collected from streams, impoundments and wetlands in the New Jersey Pinelands, 2017-2020: U.S. Geological Survey data release, https://doi.org/10.5066/P93VW8GX). These data are being analyzed and a manuscript is being prepared for potential publication in 2022.

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.

Joint 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 (TCNJ), Mr. Robert Zappalorti of Herpetological Associates, and the 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 Pinelands. 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 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, which concluded the telemetry component of the study. Corn snake telemetry data will be analyzed by research collaborators at TCNJ.

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

Above: A clutch of eggs surrounds a newly hatched corn snake. Growth and survivorship of hatchlings will be assessed in this study.

Photo/John Bunnell

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 the following year. In the spring of 2020, these held over snakes were released at the nest area Additionally in 2020, a total of 22 corn snakes were hatched out in the lab and cold released during the hatching season. In 2021, 24 corn snakes from three clutches were hatched out in the lab and cold released at the primary

nest area.

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. In 2020, the fence, cover, and traps yielded a total of 2,047 animals. Eleven species of snakes were captured, including 12 corn snakes. For 2019 and 2020 combined, the drift fence and trap array captured two headstarted and three cold released corn snakes. In 2020, to assess whether corn snakes were able to maneuver around the drift fence without getting caught, four corn snakes were radio tracked in the immediate vicinity of the fence. Twice these snakes moved from one side of the fence to the other without getting captured in the box traps, suggesting that adult corn snakes can climb over the fence.

In 2021, 14 pitfall traps were installed to provide an additional method of capturing animals at the drift fence. A total of 2,111 animals were found along the drift fence, under the artificial cover, in the box traps, or in the pitfall traps. Eleven species of snakes were found, including 14 corn snakes. Two of these corn snake recaptures were cold released snakes from 2016 and 2017. Four of the corn snakes were captured in the newly installed pitfall traps. Two other cold released corn snakes from 2016 were recaptured in two different study areas approximately 1.5 miles from the nest site where they were released.

This Joint Corn Snake Study is being funded by the Pinelands Commission and the NJDEP.

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.

Above: A four-year study will focus on the wetland-dependent eastern kingsnake. Photo/ John Bunnell

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. Scientists are using 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.

In 2020, 18 of 24 newly found kingsnakes were radio tracked in addition to the individuals that were tracked in 2019. Seven radio tracked kingsnakes died in 2020, either from predation or unknown causes. Another kingsnake was lost due to suspected transmitter failure. The remaining snakes were tracked to winter dens in the fall of 2020. In 2021, 20 kingsnakes were radio tracked through the end of the season to their winter dens. Nine other radio tracked kingsnakes died in 2021 from predation or were lost to other causes.

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

Corn Snake and Kingsnake Genetics Research

Previous genetics research by Drs. Lauretta Bushar and Howard Reinert showed that timber rattlesnake populations in the Pinelands are geographically and genetically isolated from all other populations of rattlesnakes, and that paved roads in the region provided significant barriers to gene flow among Pinelands timber rattlesnakes. No work has been done on the population genetics of corn snakes or eastern kingsnakes. These two species are members of the Lampropeltini tribe, which includes pine snakes and gopher snakes, kingsnakes and milk snakes, corn snakes and other rat snakes, and other similar species.

In 2019, Drs. Bushar and Reinert began using published genetic information on related species to develop genetic markers for corn snakes and kingsnakes. In 2020, Arcadia University, the NJDEP Endangered and Nongame Species Program, and the Commission began to collaborate on this genetic research. Snakes collected during other Pinelands snake research as well as additional snakes found dead on roads from around the Pinelands may provide enough individuals to assess levels of genetic variation, population substructure, and the effect of roads on gene flow for corn snakes and kingsnakes in the Pinelands.

In 2021, blood samples collected during previous years were analyzed. For kingsnakes, eight microsatellite loci (i.e., genetic markers) useful for population genetic analysis were identified and used to analyze samples from 30 kingsnakes. Preliminary analysis indicated that Pinelands kingsnakes displayed a similar amount of genetic variation as two populations of California kingsnakes. The genetic markers developed from available published literature could be improved upon so future kingsnake genetics research should include identifying better genetic markers.

For corn snakes, 12 microsatellite loci useful for population genetic analysis were identified and used to analyze 51 snakes, including 38 from Wharton State Forest, eight from Berkeley, and the remaining from other Pinelands areas. The Wharton State Forest population appears to be a healthy interbreeding population with no obvious population substructure. This indicates adequate genetic mixing and no isolation of the Wharton population clusters. This agrees with our Joint Corn Snake research described above where two hatchlings dispersed about 1.5 miles from their nest area and were found in different study areas. When compared to the Wharton population, the Berkeley population showed strong evidence of isolation by distance. The Berkeley population is located approximately 20 miles away from the Wharton population.

In 2021, blood samples from additional kingsnakes and corn snakes in our study areas and surrounding areas continued to be collected to increase the sample size for a more robust future analysis.

This research is being funded by Arcadia University, the NJDEP Endangered and Nongame Species Program, and the Commission through the Pinelands Conservation Fund.

Ground Skink eDNA Study

In 2020, the Commission began to collaborate with Dr. Julie Lockwood and Kathleen Kyle of Rutgers

University. Dr. Lockwood and Ms. Kyle were interested in sampling the wood and metal cover placed along the drift fence array (see Drift Fence Study above) to determine whether they could detect environmental DNA of a small, common lizard called the ground skink. Environmental DNA (eDNA) is nuclear or mitochondrial deoxyribonucleic acid (DNA) shed by organisms into their surroundings as they move, grow, breed, and decompose. Compared to terrestrial habitats, the use of eDNA is more advanced in aquatic habitats because of the ease of drawing water from the habitat through a filter and analyzing the filter for eDNA. Detection of eDNA from dry surfaces and soil is a new field of research. The use of eDNA has the potential to revolutionize traditional survey and monitoring programs that rely on visual detection by an observer, especially for secretive or rare species, such as many species of reptiles.

In late-2020 and early 2021, Ms. Kyle sampled the underside of the wood and metal cover we placed along the drift fence array and the soil beneath the artificial cover and analyzed her samples for ground skink eDNA. The results indicated that detection probabilities were 4 – 16 times greater than visual detection. Ground skink eDNA was detected under cover objects up to two weeks after the last visual detection and at some cover objects where skinks had not been visually observed in prior months. These results suggest that combining eDNA with traditional cover object surveys can greatly increase the power of detecting reptiles during surveys.

The ground skink research was funded by Rutgers University and the Commission through the Pinelands Conservation Fund. Funding is currently being pursued to test eDNA methods for the corn snake, which is an endangered species that is often ignored during most surveys conducted for Pinelands development applications.

Eastern Box Turtle Study

In this new initiative, the Commission received a 2021 scientific collecting permit from the NJDEP to begin to capture, weigh, measure, mark, and radio-track eastern box turtles. The eastern box turtle is listed by the NJDEP as a species of special concern because it is vulnerable to multiple threats, its distribution and population status in the state are not well understood, and it is potentially declining throughout its range. One goal of this research on box turtles is to gather data on turtle behavior, habitat use, movement, and use of nest sites and hibernacula in the Pinelands. Another goal is to monitor turtles in burned and unburned areas to better understand the relationship between turtles and prescribed fire. Over the course of 2021, a total of 25 box turtles were captured and processed and 20 of these were outfitted with external transmitters and radio-tracked about once each week. One of these radio-tracked turtles was lost to unknown causes and another was killed by an automobile. The remaining 18 were tracked to their winter hibernation areas.

Above: A colorful male box turtle found in the fall that is currently being radio tracked as part of the study. Photo/ John Bunnell

Public Information, Education & Outreach

Raising Awareness, Fostering Stewardship

The COVID-19 pandemic continued to pose challenges for the Commission, but staff members found new and creative ways to educate the public about the agency's work and the Pinelands' special resources.

Faced with concerns about the health and safety of holding educational events with large audiences, the staff chose to go virtual and outdoors, when possible. On April 24th, the Commission hosted a "Pinelands Short Discussion" with five well-known experts during the first-ever virtual Pinelands Short Course. The event was offered free-of-charge. The Commission organized and carried out the fifth annual Pinelands Summer Short Course on July 15th. The event included 14 programs that were held entirely outdoors at Whitesbog Village and Wells Mills County Park, including guided history tours, a canoe trip, a ground-penetrating radar demonstration, live music and nature walks. (Please see page 25 for a photo).

Above: Launched in 2020, the Pinelands Commission's Instagram site currently has more than 1,900 followers.

The Commission held its first-ever virtual edition of the Pinelands Orientation for Newly Elected Officials on July 27th. The event is typically held at the agency's headquarters and it draws around 30-50 municipal officials. The virtual offering featured four presentations by Commission staff. All four presentations have been recorded and are available for viewing on the Commission's YouTube Channel at any time. The Commission shared links to the Pinelands Orientation videos with officials in the 53 Pinelands municipalities and seven counties, and the videos have garnered 600 views thus far.

Meanwhile, staff organized, hosted and recorded 28 webinar presentations in 2021. Launched in 2020, the webinars are part of the Pinelands Speaker Series, which the Commission previously hosted at its headquarters in Pemberton Township. The webinars are livestreamed, and the public has the ability call in live to ask questions. Two webinars were delivered by Pinelands Commission staff in 2021, and the presentations

By the Numbers:

In 2021, the Commission's staff:

■ Organized, hosted, promoted and recorded 28 educational webinar presentations that are archived on YouTube and have been viewed more than 7,100 times;

■ Maintained, enhanced and reviewed every page and link on the Commission's website, which was viewed a total of 177,712 times;

■ Launched a new Twitter page;

■ Took and shared 1,065 photos on the agency's Instagram site, which was launched in 2020 and has 1,940 followers;

■ Shared 39 videos that raise awareness of the Pinelands on the Commission's YouTube Channel;

■ Shared 125 posts on 60 consecutive workdays, along with 463 photos and 26 videos, as part of an informational celebration of the 40th anniversary of the Pinelands Comprehensive Management Plan;

■ Responded to more than 1,574 public inquiries about recreation, general information about the Pinelands and the Commission, and other non-development application questions; and

■ Organized and carried out the first-ever virtual Pinelands Short Course and first virtual Pinelands Orientation for Newly Elected Officials. Recordings of the two events have garnered 570 views on YouTube.

focused on native Pinelands snakes and a local history of Tuckerton Borough. Every webinar is recorded, archived and is available for viewing on the Commission's YouTube Channel at any time. The video webinar recordings were viewed more than 7,100 times in 2021, and the Commission now has an archive of nearly 60 webinar recordings on YouTube. The Commission will host additional webinars throughout 2022 but may offer some in-person presentations if conditions permit.

Above: Commission staff created a new Instagram site for the Jersey Devil in 2021. Photo/Paul Leakan

Commission staff also completed a comprehensive review of the agency's website in 2021, and they hosted numerous virtual field trips for school groups, launched a Twitter account, created a new, educational Instagram site for the Jersey Devil, and shared 1,065 photos on the agency's Instagram site. The site was launched in 2020, and it now has 1,940 followers.

Above: More than 50 people attended the fifth annual Pinelands Summer Short Course on July 15, 2021. The event was held at Whitesbog Village in Burlington County and Wells Mills County Park in Ocean County. Photo/Paul Leakan

Pinelands National Reserve Calendar

The Pinelands Commission issued its sixth edition of the Pinelands National Reserve wall calendar in late November 2021.

The calendar features a theme of plants and animals and includes 38 stunning photos that showcase the native species that can be found in the Pinelands. The Pinelands is home to 850 species of plants and nearly 500 fish, bird, reptile, amphibian, mammal, and invertebrate species. This includes 92 plant species and 43 animal species that are listed as threatened or endangered.

Above: The front cover of the 2022 Pinelands National Reserve wall calendar features a photo of native, insect-eating pitcher plants.

The Commission worked with Rowan College at Burlington County to design and print 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 holidays, dates of Pinelands Commission meetings and important dates in Pinelands history.

A total of 820 copies of the calendar were printed and distributed free of charge at the Bass River State Forest, Batsto Visitor Center, Belleplain State Forest, Brendan T. Byrne State Forest, and the General Store at historic Whitesbog Village. The project was funded by the National Park Service.

Finances

Fiscal & Budget

The Commission's Operating Budget for Fiscal Year 2021 totaled $5,915,074. Of this, $4,955,565, or 83.78% percent, was budgeted for personnel expenses.

Budgeted revenue sources included $585,000 in federal grants, a $3,099,000 State appropriation, $688,000 in State grants and other State funding, $380,000 in application fees and $1,163,074 from the Commission's fund balance and reserves.

The 2021 budget for the Kirkwood-Cohansey Study, funded through legislation passed in 2001, was $31,624. The budget for the Pinelands Conservation Fund was $830,616.

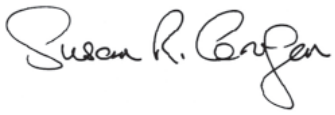
The Commission's Audit Report for Fiscal Year 2020, which ended June 30, 2020, is posted on the State Auditors web site. The website address is: https://www.njleg.state.nj.us/publications/auditor/03002221.pdf.

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 2021, unaudited application fee revenues actually collected totaled $643,428.96, $264,030.47 more than Fiscal Year 2020.

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 2021 calendar year, all of the Commission's standards, procedures, and internal controls were followed.



Susan R. Grogan
Acting Executive Director

Scenes around the Pinelands in 2021

Above: This bald eagle was photographed from a distance in the Pinelands in November 2021. Once nearly extinct, the bald eagle population in New Jersey is now soaring, thanks to conservation efforts.

Above: A bright pink sunset reflected off Atsion Lake in Wharton State Forest in this photo that was taken in mid-November of 2021. Wharton State Forest encompasses approximately 122,800 acres.

Above: This variegated fritillary butterfly was photographed on a patch of native, sweet goldenrod at the Pinelands Commission's headquarters in August 2021.

Above: Native sheep laurel could be seen blooming in the Pinelands in late May. The deep pink blooms brighten the landscape.

Photos by Paul Leakan
NJ Pinelands Commission

Cover image: Reflections of Atlantic white cedars in the dark water of Skit Branch in Wharton State Forest. Photo/John Bunnell